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RESOURCE MANAGEMENT: AN HISTORICAL PERSPECTIVE(U)
ANALYTIC SCIENCES CORP ARLINGTON VA L S REED ET AL.
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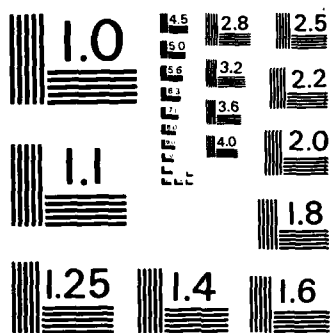
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RESOURCE MANAGEMENT:

AN HISTORICAL PERSPECTIVE

31 December 1984

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PREFACE

The Analytic Sciences Corporation (TASC) has prepared this analysis of historical experience with resource management programs to provide guidance to future resource management planners. While there are many ways in which the economy or government has changed since our major mobilization experiences in the 1940s and 1950s, many important lessons of history are still applicable in the present-day environment. As the generation of experienced resource managers from the Korean War retires, it is useful to provide a summary of these historical lessons.

The preliminary report under this contract contained the principally historical analysis, which was reviewed and included, in modified form, in this final report. This report also includes an analysis of how these lessons apply in the present day and recommendations for future resource management functions, organizations, and authorities.

Many people contributed to this report. Thanks are due to Leo Pannier and Don Carson of TASC for their insights and suggestions, to Gerry Oplinger, Art Dover, and Dr. Clair Blong of FEMA for their comments and support; to Iain Baird, Rod Joseph, and Harold Hendon of the Department of Commerce; to TASC consultants Tony Bertsch, Paul Hammond, and Leonard Sullivan for their useful comments; and to TASC's support staff, Denise Rekemyer, Carolyn Watts, and Ray Sebens, for their unusual diligence and patience. Thanks are also due to M. Arnie Marvin, who played an important role in shaping the authors' conclusions, recommended additional readings, and was always available for advice and counsel.

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EXECUTIVE SUMMARY

↙ This report summarizes the principal lessons of past mobilizations, and identifies critical issues for resource management and organizational planning for future conflicts. As such, it is not a comprehensive historical narrative of prior mobilization experiences, but is an applied history document focusing on policy lessons and illustrations.

The organization of this report follows the structure of TASC's conceptual tool created for ^{Federal Emergency Management Agency} (FEMA*) that examines the interplay of economic and strategic factors involved in industrial mobilization. This organization places our observations in an overall framework which will facilitate application of the historical lessons to today's needs.

Perhaps the major conclusion drawn from our review is that resource management programs must be flexible and must be geared to the intensity of the conflict. "Limited" wars will require some increased resource management actions, although these actions may be severely constrained. Similar constraints may be applicable during the ambiguous early warning period preceding a major crisis. Development of limited resource management programs which avoid excessive or premature control and over-expansion while still providing the needed levels of resources may be the greatest challenge facing the resource management planner.

*Dawson, H.S., et al., "Assessment of U.S. Industrial Mobilization Capability", The Analytic Sciences Corporation, TR-4532, July 1983.

No matter how effective mobilization plans are, time will be required to reorganize the economy to emphasize military production. Because the U.S. is unlikely to have the luxury it had in World War I and World War II, when hostilities had been underway for more than two years before the U.S. became involved, decision-making procedures must be established to allow action on warning to increase production prior to the onset of hostilities. The time required to mobilize U.S. industry can be reduced by effective planning, but the time still will be substantial. This requirement for time is especially valid in the case of preparatory actions, because they inherently will be actions taken on ambiguous signals, subject to lack of public consensus, and therefore, somewhat tentative.

The need for pre-conflict preparatory actions suggests the need for mechanisms to harness latent industrial capacity prior to conflict. Such preparatory actions probably would include "surging" the production of military items already being produced. However, a decision to surge current military production, if taken primarily to avoid the necessity to mobilize, might be counterproductive. The time consumed by the surge period would be lost to the slower but more substantial processes of industrial mobilization. If coordinated with early preparatory actions, surge may reinforce and accelerate industrial mobilization. However, if surge is undertaken in isolation, it may very well retard the processes of industrial mobilization.

Pre-war planning requirements also should allow for flexibility. Excessively rigid planning requirements are likely to be wrong. Frequently, they will be too low, but this will not always be the case; planners have at times provided "unconstrained" requirements far in excess of what was feasible. Additionally, demand from the civil sector and

possibly from Allies is as important for resource management as military requirements. Planning for resource management while ignoring these two components of overall demand will yield artificially low requirements. Given the uncertainty as to how a conflict might develop, in terms of both scale and timing, TASC has concluded that requirements should remain flexible. This has an impact on resource planning, for such planning cannot be performed against a single requirement, but instead must consider the capability to meet a variety of potential requirements.

For major increases in production, strong resource management actions are necessary. Relatively simple systems, such as the existing priorities, allocations, and special assistance systems, can work effectively if resources are not in extremely short supply, but if major shortages and bottlenecks emerge, these existing systems will be rapidly overwhelmed. History has shown that resource shortages tend to cascade through the economy and impact on all programs if they are not resolved promptly. The most difficult problems for resource managers often have been during the period of transition from low levels of control to total control. Resource management efforts involve extremely sensitive political and economic issues.

In a major mobilization, existing defense capacity is considerably less important than the ability to harness new capacity efficiently, in the form of expansion and conversion. This historical experience remains valid today, although the permanent defense sector is now much larger than that available at the onset of prior mobilizations.

Mechanisms are needed not only to control resources, but also to pay for facility expansion and conversion.

Especially before a conflict begins, prospective contractors will be reluctant to infringe on their existing production and financial positions. They will undertake expansion or conversion on their own only very reluctantly without some assurance that their efforts will be reimbursed.

The impact of the political process on industrial mobilization is all too frequently ignored by planners. No evidence suggests that the normal political processes are adjourned during mobilization; if anything, political and bureaucratic controversies became more pronounced during past mobilizations. The political process can have a major impact on the structure and implementation of resource management programs.

Based on our historical survey, we have concluded that the specific organizational configuration created to manage industrial mobilization is only of secondary importance. Stability and continuity of organizations and functions during the transition from peace to war is desirable, but many different configurations have been attempted, representing divergent policies and approaches. Several of these worked successfully.

This is not meant to imply that organizational questions are unimportant. One significant requirement is for a single, central coordinating authority who has the power to rationalize military, civilian, and allied requirements. Implementation of central policy decisions can be delegated or centralized, and organizations can otherwise be flexible, but there must be a single central focus to orchestrate production, to control the flow of resources, and to resolve conflicts.

Peacetime mobilization planning should concentrate heavily on the tasks to be performed and the manner of

performing the tasks, and relatively little on specific organizational structures to perform the task. Planning for organizations must remain flexible enough to accomodate differing Presidential policies and organizational approaches.

The need for flexibility also applies to planning for legislative authorities. Principal attention must be given to what can be done within the framework of existing legislation. Planners often assume that the first step in executing mobilization is to obtain a broad, omnibus emergency powers statute from Congress. Congressional action on any proposal is difficult to predict, and historical experience shows that important preliminary measures have always been implemented without requesting additional authority. Actions that can be taken within the existing statutory framework are especially important during the pre-conflict phases, when Congress may be less willing to consider new grants of authority. Even after war begins, however, the examination of history shows a continuation of the turbulence, unpredictability, and special interest representation in the legislative process that are part and parcel of American politics.

For all the reasons enumerated earlier, a principal lesson for mobilization planners is that mobilization resource management and organizational plans must be flexible. Mobilization, in all likelihood, will not be executed in exactly the same way the plans contemplate (and, correspondingly, the more detailed and inflexible the plans are, the more likely they are to be "wrong"). Plans must be written with enough flexibility to permit different Presidential or legislative branch approaches. They must accomodate a wide range of possible requirements. They must be designed to be implemented by any of a variety of organizations. Otherwise, these plans run the risk of irrelevance.

1.

INTRODUCTION

This report expands upon and completes the draft final report submitted earlier under Federal Emergency Management Agency (FEMA) Contract No. EMW-83-C-1388, Resource Management Functions, Assignments, Organizations, and Authorities. As part of the project purpose of developing proposed resource management organizations and procedures, The Analytic Sciences Corporation (TASC) was asked to examine resource management issues with respect to establishing and controlling procurement programs during World War II, the Korean conflict, and the Vietnam conflict. The contract also required applying these historical lessons to planning for future industrial mobilizations. This report incorporates comments made by project advisors and FEMA personnel on the draft report and completes the project by discussing government resource management configurations, coordination procedures for policy-making during a national emergency, and new legislation which may be needed to implement resource management programs or create emergency resource management organizations.

1.1 BACKGROUND

Past mobilizations provide fertile ground for study by mobilization planners. At least since the years immediately preceding World War II, there has been an abundant record of past mobilization experiences, and planners have used this record extensively. However, too frequently it has been assumed that there is a single "right" answer to controlling resources, and that proper study and application of history,

with appropriate modifications to correct "mistakes," could yield correct answers for future planners. This has sometimes led to an excessively mechanical approach toward the study of history, wherein planners have sought to perfect a given model of past behavior and assumed that this perfected model could provide a "blueprint" for future mobilizations.

There are two shortcomings with this approach. First, many changes have occurred in the U.S. world position since the 1940s and 1950s, and many of these changes could fundamentally alter the shape of future mobilization vulnerabilities and programs. Such changes include:

- The enormous expansion in the size and scope of the permanent federal bureaucracy, including establishment of numerous new resource agencies and permanent national security policy and economic policy organizations
- Changes in the structure of the U.S. economy and the growing dependence of the United States on imported energy, materials, and manufactured items
- A significant change in the U.S. foreign policy position, which probably would not allow the nation to remain on the sidelines, taking preparatory actions and husbanding its economic strength, during the early phase of a world-wide conflict
- The emergence of a permanent national security production structure, which provides a baseline of procurement procedures and existing contractors
- Changes in weapons technology that have increased the demand for parts, exotic materials, and unique production processes, making the resource management task more challenging.

In addition, attempts to review the past as a sterile, scientific laboratory ignore the impact on past events of politics, of personality conflicts, of Presidential management styles, and similar unquantifiable factors. In examining historical mobilization lessons, the planner must examine not only the policies, procedures, and organizations that were established to implement policy, but also why these decisions were made, what factors led to these decisions, and how the present system might similarly influence modern decisionmakers. Certain broad historical lessons clearly apply from past mobilizations. Typical resource management problems might be very different in a 1980s environment than in the 1940s, but the generic types of problems, solutions, and political controversies may well be very similar.

1.2 METHOD AND PURPOSE OF THIS REPORT

This report is intended to be a broad overview of resource management concepts and methods. To prepare this report we performed a limited survey of historical literature. Because of the limited scope of the historical phase of the project, no effort was made to undertake a comprehensive review of all potentially relevant documents, studies, and books on past mobilization, procurement, and resource management issues. Instead, the project team sought to strike a balance in its survey, covering a wide range of publications to provide sufficient scope and detail.

TASC's project team assembled a candidate list of publications which it considered worthy of review. This list was reviewed and discussed by other TASC analysts, TASC's advisory panel members, and FEMA personnel in order to refine the list of documents.

The documents reviewed included government reports prepared during the mobilization efforts, government after-action reports and historical surveys, memoirs of participants, and books prepared after the fact by professional historians not directly involved in the resource management programs. The coverage of the documents varied. Some were broad surveys of several mobilization periods, while others concentrated specifically on one time period. Some addressed organizational issues, some concentrated on political controversies, some focused on procurement decisions, and some were focused on the resource management programs themselves. Books and documents reviewed for this report are discussed in Appendix A.

The project team sought to focus continuously on the ultimate project objective in its historical survey. No effort was made to prepare a comprehensive record or detailed chronology of mobilization programs, organizations, resource management decisions, or political controversies. These stories have been well-told, especially for World War II, in a number of memoirs and historical studies still available to the scholar or planner interested in such matters. The purpose of this effort was to draw a number of conclusions on the basis of available historical evidence and to present the conclusions in a manner useful to present-day resource management planners.

Certain general themes emerged from the historical survey. It was then necessary to consider the impact of changing circumstances and to determine how these circumstances would affect resource management programs. We prepared an inventory of current laws affecting resource management programs and reviewed resource management planning programs and organizational alignments. We then applied the

historical "lessons learned" to these present day plans and authorities, in order to test our present capability to carry out the types of programs implemented in the past. (Current legal authorities for resource management are described in Appendix B.)

This report makes no attempt to establish a "Blueprint" for future mobilization organizations and programs. It was our conclusion, after surveying past experiences, that planning effort expended on preparing precise, step-by-step guides is likely to be ineffective because of the numerous uncertainties involved. Instead, this report suggests that planners should focus, at least initially, on identifying general problems that are likely to arise and methods for solving these problems. This report attempts to identify some of these problems and methods. (Appendix C discusses these opposite planning approaches.)

TASC recently prepared a report for FEMA that created a conceptual tool for examining the interplay of economic and strategic factors involved in industrial mobilization.* (See Figure 1.2-1.) This methodology considers the interrelationships of the following factors:

- Scenario and strategy decisions
- Force structure requirements
- Impact on industry sectors
- Resource availability and requirements
- Sources of new resources

*Dawson, H.S., et al., "Assessment of U.S. Industrial Mobilization Capability," The Analytic Sciences Corporation, TR-4532, July 1983.

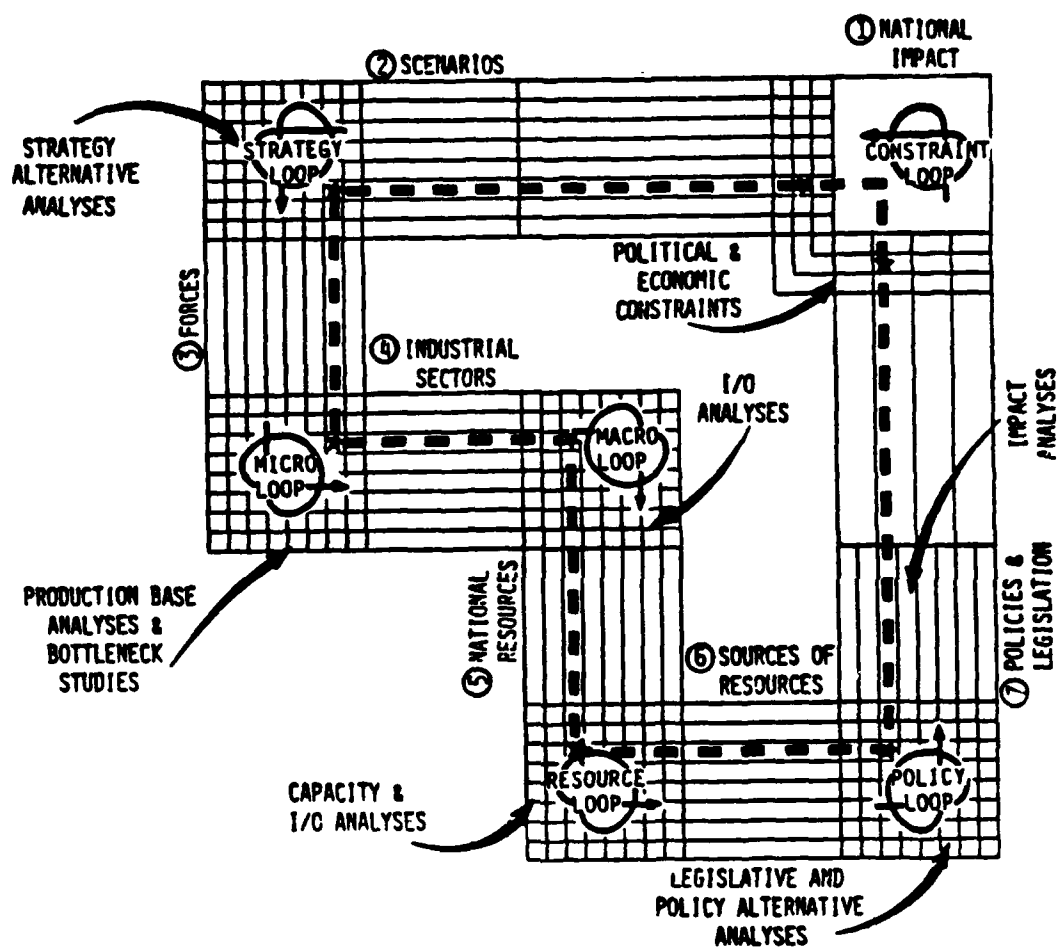
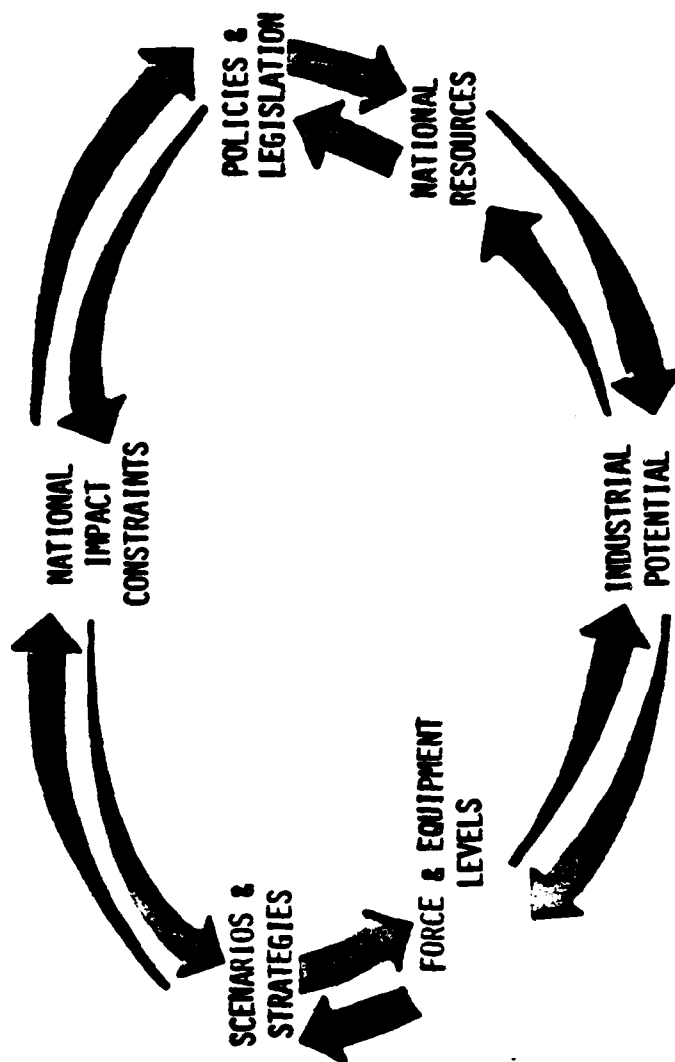


Figure 1.2-1 TASCMAIN Model -- Specific Methodology

- Policies, legislation, and organizations to manage the mobilization effort
- Constraints imposed by the political process or by the nature of the scenario itself.

This methodology displays the flow of requirements through the economy. Each category generates requirements on the following one. It can also be used to consider options, capabilities, and tradeoff opportunities, by flowing resources up through the structure and by showing the implications of alternative policies, resource management strategies, or procurement decisions. (See Figure 1.2-2.)

This general framework was adopted for presenting this report. Chapter 2 presents an overview of resource management issues and introduces some key limiting factors, such as the lead time required to mobilize industry. Chapter 3 discusses the implications of this framework in analyzing strategies and requirements generation. This chapter takes a "top-down" approach to the methodology and shows the impact of resource limitations on strategy and subsequent requirements generation. Chapter 4 discusses resource management controls and the role of government in managing a mobilized economy. Chapter 5 discusses possibilities and limitations on conversion and expansion of the economy to provide additional resources. Chapter 6 describes policy, organizational and legislative issues, constraints, and other factors which dictate flexibility in planning. Chapter 7 presents conclusions. A selected bibliography, including all of the sources consulted in our review, is provided in Appendix A. Appendix B contains a discussion of existing legal authorities for resource management.



ASSESSING MOBILIZATION POTENTIAL IS A CLOSED LOOP, ITERATIVE PROCESS INVOLVING EXTENSIVE TRADE-OFFS TO MINIMIZE IMPACT OF BOTTLENECKS

Figure 1.2-2 General Methodology -- Principles

Appendix C provides a further discussion of two alternate planning methods -- the "blueprint" approach and the "problems and methods" approach -- and Appendix D contains excerpts from the 1947 mobilization plan which describe planning and warning assumptions.

In any major mobilization, fundamental changes occur in the relationships in the economy. In past major mobilizations, the economy has shifted from one largely based upon the price mechanism to one where resource administration is much more significant. The voluntary relationship between buyer and seller has been altered, at least to the extent that increased military requirements create resource shortages or force curtailment of non-essential production. "Total War" in the twentieth century has been a commitment of all of the resources of a nation (economy, people, physical assets) in a life or death struggle with an enemy. Such wars have tended to be protracted and economic resource commitments have been out of proportion with the wars of prior centuries.

Since World War II, the United States has been involved in two "limited" wars, with objectives uniquely different from those of the two world wars. The U.S. responded to the invasion of South Korea with a massive preparedness program, anticipating the possibility that this attack was the strategic warning for World War III. But the 1950s passed without such a war and the economies of the rest of the world began to recover. In the 1960s the U.S. became involved in a war in Vietnam that was fought rather as an "after thought" in terms of the economy, with only a very low level of industrial mobilization. The U.S. force commitment was on about the same level as Korea but no accompanying national industrial preparedness effort for a wider war was involved. The war in Vietnam was accompanied instead by a drawdown of war reserve stocks and an apparent deferral of military force structure and modernization initiatives.

This new form of conflict demands a special approach to resource management. Resource controls which are viewed as being excessive for the limited objectives (e.g., Korea) may threaten the national consensus on foreign policy objectives. On the other hand, trying to limit the economic impact of military buildups by avoiding austerity and controls can cause resource or equipment shortages or otherwise affect military force readiness. If resource management controls are deferred too long, the result can be resource shortages throughout the economy. Too much control or too little control is equally dangerous.

Today, with the U.S. and the U.S.S.R. at a rough parity in strategic nuclear arms, the possibility of large-scale conventional war is being reexamined. The need for industrial mobilization planning is also being explored. In the context of our recent experience with armed conflict, it is evident that mobilization planning must focus on a range of possible conflicts. While all-out mobilization may be more stressful for the economy, this may not be either the most likely scenario or the most difficult resource management challenge. "Limited" wars may be more likely, and pose their own unique resource management problems.

2.1 RESOURCE MANAGEMENT IN CONTEXT

Bernard Baruch, quoting a 1918 War Industries Board pamphlet in his American Industry in the War, defined the basic economic elements of national industry as:

- Facilities
- Materials

- Fuel
- Transportation
- Labor
- Capital.*

The role of any government in a national mobilization is to manage these economic elements or resources to maximize the output of war materiel and still provide for necessary civilian consumption. The measure of control must be balanced between these two possibly conflicting requirements.

Even in the most extreme of situations, the complexity of the economy indicates that the resource manager should only attempt to manage at the margins. Thus, the role of the resource manager is to solve or prevent bottlenecks by managing the critical elements of the economy. The War Production Board (WPB) identified these critical elements:

The joint meetings identified five principal causes of criticality: (1) facilities were inadequate to produce the desired quantities; (2) there were not enough workers with the proper skills; (3) materials or components were not flowing fast enough; (4) program requirements had been stepped up so sharply that production could not be adjusted rapidly enough to meet the greater needs; or (5) the introduction of new designs was delaying production. Obviously, more than one of these causes might be present in any given program and the proportion of the blame assignable to one or another varied from month to month and from program to program during 1944.†

*"Capital" includes both capital equipment and financial assets.

†U.S. War Production Board, War Production in 1944 (Washington. Government Printing Office, 1945), p. 19.

2.2 MOBILIZATION LEAD TIMES

Planners must account for substantial lead times for industrial mobilization, regardless of the quality and extent of pre-war plans. Mobilization lead times for conversion, expansion, and increasing production may be reduced but cannot be avoided. In most of the conflicts studied for this survey, the U.S. had the advantage of substantial warning. For example, in World War I, Europe was at war for nearly three years before the U.S. became involved. Similarly, in World War II, war in Europe broke out more than two years before Pearl Harbor. In the Korean War, although the North Korean army struck without warning, the national leadership acted effectively to prepare for what it perceived as a substantial threat of World War III. In Vietnam, "warning" does not apply as clearly, but even in this instance the United States had the strategic upper hand and could more or less dictate the pace of growth of its own force commitments.

In World War II and the Korean War, the U.S. made fairly effective use of its perceived warning time. Pre-war mobilization efforts were well under way by the middle of 1940 and considerable progress had been made by the time of Pearl Harbor. After the 1950 invasion of South Korea, the U.S. almost immediately began to undertake actions to control and mobilize the economy. Yet, in these cases, it took a two-to-four year period to reach peak production. World War I ended before production peaked, but the experience is consistent. Starting from essentially a standing start, the U.S. would have achieved peak production in 1919, two years after it began and, as it turned out, the year after the war ended.

Of course, critics have argued that these efforts could have been conducted more efficiently. More effective

plans and improved resolve undoubtedly could have improved mobilization programs. One principal purpose of pre-war plans is to reduce lead times and confusion, and such plans, if implemented, can clearly reduce the time required. It is feasible that the nation can generate more effective plans than those available in the past. However, nothing then could or now can eliminate this lead time. Thus, anticipatory actions -- actions taken prior to the onset of armed conflict -- assume greater importance.

2.2.1 Warning and the 1947 Mobilization Plan

The importance of warning was officially recognized in national mobilization plans on one occasion. Immediately after World War II, the Munitions Board went through an extensive exercise in developing mobilization plans. To this date, these plans remain the most complete peacetime mobilization plans ever prepared by the U.S. While they were unsuccessful in the sense that the organizational scheme outlined was not implemented during the 1950 mobilization (see Section 6.2.3), the plans represented an important step forward in several respects. They reflected the importance of time in several ways.

One basic assumption of the 1947 plan was that the U.S. would probably be an early belligerent in any future major war. Accordingly, World War II-type warning was considered unlikely:

There will not be a long period available for gradual mobilization while allies carry the burden of combat. Planning for mobilization must cover both the contingency of a sudden attack on the United States with an instantaneous transition from peace to war and also the possibility of a period marked by a rapid

and serious deterioration of international relations during which important preliminary measures of mobilization could be taken although the full war powers would not be in effect.*

Thus, the plan provided for two fundamentally important prerequisites to mobilization:

- The maintenance, in peacetime, of a high degree of preparedness for mobilization
- Recognition of the possibility that there might be a "pre-emergency phase" in which preparedness would be augmented beyond normal peacetime levels.

The plan described an extensive list of preparatory actions necessary in peacetime to preserve an adequate preparedness posture. (See Appendix D for extracts from this plan.) It also included a brief list of actions which should be taken during the "pre-emergency" phase:

- Final recruitment plans for top personnel to staff new or augmented agencies
- Administrative arrangements for government expansion, including assignment of personnel, assembling of small operating staffs, and contracts for office space, telephone equipment, and supplies
- Refinement of peacetime estimates of wartime requirements and resources
- Intensification of procurement activities, including expansion of facilities, activation of standby facilities, modification

*U.S. Munitions Board, 1947 Plan, Annex 82: Industrial Mobilization - Office of War Production (Washington, D.C., Government Printing Office, 1947), p. 5.

of procurement methods, and placement of contracts.*

2.2.2 Action on Warning

These twin concepts -- maintenance of peacetime preparedness and pre-conflict actions to increase readiness -- are critical to mobilization preparedness for a number of reasons. As will be discussed later in this report, significant expansion of capacity or conversion of new producers would be needed -- as in the past -- for anything beyond a modest increase in output of defense end items. Because of the likelihood of early U.S. involvement in future conflicts, it is unlikely (as the 1947 planners recognized) that the U.S. would have the advantage of the types of warning it enjoyed before World War I and World War II.

In the past, preparatory actions preceding U.S. involvement in conflict were necessarily somewhat tentative. While many people at the time criticized the hesitant and inefficient nature of the pre-World War II rearmament efforts, it is difficult to see how these pre-conflict efforts could have proceeded with much more vigor. The country was seriously divided, with many powerful voices opposing any action that they saw as increasing the risk of war. Business was reluctant to convert or expand production for a war that might not come unless their investments in war facilities were guaranteed; even then, many businessmen were extremely reluctant to interfere with their commercial position.

For similar reasons, any future action on warning is likely to be somewhat tentative. Indeed, the factors which

*Ibid.

led to the slow pre-war buildup in 1940 and 1941 could have an even greater impact on any future anticipatory mobilization. American business has felt increasing vulnerability -- in both U.S. and foreign markets -- to foreign competition. The fear of market erosion could greatly increase the reluctance of U.S. business to invest in defense production facilities or to convert capacity, unless government preparedness policy were accompanied by trade policies protecting existing markets.

Modern changes in the nature of defense weapons and the defense industry are likely -- if anything -- to increase mobilization lead times. Increased complexity of weapons systems, together with specialization of the production process, are likely to make conversion and expansion more difficult, increase the time required for these activities, and increase the importance of peacetime conversion/expansion preparedness plans.

Despite the importance of time, there has been a persistent belief among planners in the feasibility of "M-Day" plans, which provide for a particular day upon which authorities are sought and received from Congress and other mobilization plans are implemented. The Army's mobilization plans prepared in the 1930s provided for such an "M-Day," with little in the way of preparation, other than refinement of plans, to occur before that day. Recent mobilization plans have also taken on characteristics of "M-Day" plans, by linking industrial mobilization with military manpower and reserve forces mobilization and deployment concepts and timetables and ignoring the need for early industrial actions. The failure to plan for pre-war preparations short of total mobilization was one of the principal reasons the mobilization plans of the

1930s were rejected and is one of the central lessons of the history of U.S. mobilization for World War II.*

2.3 THE CHANGING NATURE OF BOTTLENECKS

The items or materials that constrain output will change during the course of mobilization. History's guidance suggests that machine tools will be in short supply in the initial stages of a major mobilization, as the government struggles to re-tool civilian producers for defense procurement and builds new plants for the manufacture of military items.[†] Machine tools were the primary bottleneck in the first years of the World War II mobilization and the greatest constraint on production after the outbreak of the war in Korea.[§] After

*The distinction between "M-Day" as a national planning concept and an actual timetable is important. While no problem is posed by the planner's arbitrary establishment of a theoretical "M-Day" as a hub for mobilization actions, there is a risk if this theoretical "M-Day" is regarded as the beginning of actions. A President is not likely to ever say "Yesterday we were not mobilizing, and today we are." Such a volatile first step is tantamount to declaring war. However, the danger of these plans is not their establishment of a theoretical "M-Day," but rather is the risk that non-conflict preparatory actions will not be taken until much too late.

[†]This discussion is focused on a situation requiring large-scale expansion of capacity. During a surge, or during the early phases of mobilization (i.e., before efforts to increase capacity) problems are likely to be found in obtaining a sufficient flow of parts for increased production and, perhaps, in finding a sufficient number of skilled workers to staff a second or third shift at existing producers. Individual in-plant bottlenecks are also likely problems. The sequence discussed in this section assumes that these problems have largely been solved or have receded into insignificance because of the magnitude of the conversion/expansion requirements.

[§]Lincoln, George A., The Economics of National Security (New York, Prentice-Hall, 1954), p. 290.

an initial re-tooling, machine tool orders will decline sharply. World War II showed this pattern most clearly. In the early rearmament and war years, machine-tool production doubled each year, from \$200 million in 1939 to \$440 million in 1940, to \$775 million in 1941. However, production of machine tools peaked in 1942, at \$1.3 billion, declining thereafter to \$1.2 billion in 1943, \$497 million in 1944, and \$423 million in 1945.*

If, as in past mobilizations, the government favors the construction of new facilities over the conversion of civilian factories, construction is also likely to become a pacing factor in the first stages of mobilization.[†] Construction and machine tools were the critical programs during the early stages of the World War II industrial mobilization.

As the economy becomes fully mobilized for war production, the demand for machine tools and new construction subsides. As the nation becomes successful in creating sufficient production capacity to fulfill military production requirements, basic metals and raw materials tend to become the critical constraints. Improving the flow of materials can then lead to bottlenecks in the production of components, which may slow the output of finished systems. The Annual Report of the War Production Board for the year 1944 describes this phenomenon:

*Joint Committee on Defense Production (JCDP), U.S. Congress, Progress Report Number 13-Machine Tools (Washington, Government Printing Office, 1952), p. 6.

[†]The construction bottleneck could be especially severe if a major mobilization were accompanied by a major civil defense program. Management of alternate claims for construction industry support could be a particularly serious resource management problem.

Immediately after the fall of France, the critical programs were the construction of facilities and the production and distribution of machine tools ... The expansion of facilities caused bottlenecks elsewhere. As machine tools were installed, the capacity to consume metals outran the capacity for producing them ... Once materials began to flow into munitions plants, bottlenecks developed in the production of components ... The history of war production is the history of the breaking of bottlenecks.*

The war economy continued to function during World War II because the government was largely successful in minimizing material bottlenecks as they emerged. Late in the mobilization, problems began to arise in infrastructure industries. Additionally, at the height of industrial mobilization, manpower shortages developed. Despite efforts to re-train and re-locate workers and to integrate millions of women into the labor force, manpower proved to be the ultimate constraint on production.[†] Not only did labor prove to be the final bottleneck, but it also proved to be the most difficult resource to manage.

Because an industrial mobilization effort is paralleled by an equivalent military mobilization, manpower may well become the overriding consideration. Potentially conflicting demands for the young, skilled portion of the work force will inevitably arise. For example, using a nominal current total work force of 140 million men and women, two percent are actively employed by the Defense Department (2 million in uniform, one million civilians) and another one

*War Production Board, op. cit., p. 14.

[†]Connery, Robert H., The Navy and the Industrial Mobilization in World War II (Princeton, Princeton University Press, 1951), p. 315.

3.

STRATEGIES AND REQUIREMENTS

3.1 REQUIREMENTS GENERATION

Estimation and coordination of requirements is one of the most difficult tasks facing the resource management planner. Historical experience suggests that pre-war estimates of requirements will be wrong, no matter how conscientiously they are prepared. In all likelihood, projected requirements for all-out mobilization will be too low, although this is not necessarily the case. For instance, in the early-1930s mobilization plans, requirements were based solely on the projected capability to mobilize military manpower, without taking into account the limitations of the civilian labor force and civilian production capabilities. Thus, these stated requirements were higher than practicable.*

3.1.1 Difficulties in Determining Requirements

Given the broad range of scenarios that might require U.S. involvement, there is a danger that requirements will be estimated for the wrong war, especially if an attempt is made to generate a single set of agreed-upon requirements against which all plans will be prepared. This problem was seen at the outset of both the Korean and Vietnam conflicts, where

*Holley, Irving B., Buying Aircraft: Materiel Procurement for the Army Air Forces (Washington, Chief of Military History, 1964), pp. 151-152.

planners had focused on worldwide, nuclear, or central European scenarios, to the exclusion of more limited contingencies.*

In the period before World War II, a number of other problems were experienced which are likely to recur when planning requirements for future conflicts. For example, specific end item requirements (as well as other supporting requirements) are largely determined by factors beyond the planner's control. In discussing Navy pre-war requirements planning, Robert H. Connery summarized the problem:

It was a fundamental axiom that what the Navy needed depended on what the Navy was going to do. Was it to fight a war in the Atlantic or the Pacific or in both at the same time? Was it merely to defend our coasts or to convoy a great Army overseas? And, once convoyed, was the Army to be maintained from bases in this country or from bases overseas? ... Furthermore, material requirements depended on the ingenuity of the enemy and the fortunes of war. For example, who could have foreseen the Pearl Harbor disaster and the ship-repair program which it necessitated?†

*However, "limited war" does not necessarily mean limited requirements. In the Vietnam war, a limited war by any definition, consumption of selected items was far in excess of approved mobilization requirements. For instance, according to one study, Mark-80 iron bomb mobilization requirements were only 10 percent of Vietnam consumption rates. (Vawter, R., Industrial Mobilization: The Relevant History, Washington, National Defense University Press, 1983). p. 51.

†Connery, op. cit., p. 88.

Requirements also depend heavily on the expected duration and intensity of the conflict being planned for, and on the warning time available. Connery notes:

The speed required for completion of any armament program determines in large measure the extent of the (new) facilities required ... Facilities of ample size for a six-year program could not meet the needs of the same program telescoped into three years.*

Prior to World War II, while the total size of the armament program was only occasionally changed, the target completion dates varied between programs, and were constantly moved forward. These types of changes can have an enormous impact both on end-item production requirements and on the intensity of resource management needed to support procurement programs, yet they are almost impossible to specify with any precision prior to the onset of conflict.

3.1.2. Component and Material Requirements

Even when planners could establish end-item requirements, they have had difficulty in developing statistical information to assess production capacities or to develop associated component and materials requirements. Yet, component and materials shortages tend to be the most serious bottlenecks to increased production.

A post-World War II study by the Civilian Production Administration concluded that the failure to identify end-item bills of materials was a principal cause of the earliest materials shortages, which were first experienced early in 1941. Without adequate visibility of the impact of rearmament on

*Ibid.

materials supply, planners could not predict shortages or determine when civilian production curtailment or capacity expansion was needed.*

The impacts of these "flow down" requirements were not limited merely to the end-item bills of materials (which were difficult enough to derive); they also affected the need to construct new plants, to produce new machine tools, to equip the plants, and to transport materials to and from the plants. Each of these associated requirements created, in turn, their own materials, machinery, and manpower requirements, and so on. The cascading of requirements through the economy, down to the basic materials and infrastructure support levels, and the interactions of requirements at these levels, were difficult problems throughout all past mobilizations. While establishing definite end-item requirements in advance of conflict may have been impossible, the requirements for components, materials, and other infrastructure support per unit would have been possible (though difficult) to generate. Generating bills of materials per end item at least could have shown the ultimate economic impact of new production programs, once end-item requirements were defined.

3.1.3 Machine Tool Requirements

Machine tools pose a unique requirements problem. As mentioned earlier, machine tools have generally been critical front-end bottlenecks in past mobilizations because they are an essential factor of production. Both the supply and demand for machine tools are broad-based. They are produced by a large

*U.S. Civilian Production Administration, Industrial Mobilization for War: History of the War Production Board and Predecessor Agencies (Washington, Government Printing Office, 1947), pp. 91-92.

number of relatively small firms, and are required by virtually all defense contractors and subcontractors.

Because of differing design and manufacturing philosophies, it even proved impossible to estimate machine tool requirements for new plants on the basis of an existing plant's utilization of tools. The differing production philosophies or desire to fully utilize existing tools could lead alternate producers of the same item to place vastly different machine tool orders. (See Section 5.5.2.) By January 1952, well into the Korean War mobilization, it was reported that the National Production Authority "has been unable to obtain even a rough estimate as to the type of tools that will be required or an estimate of the quantity involved."*

3.1.4 Manpower Requirements

Planning for industrial manpower forms a unique subset of the requirements process. Although estimates need not be as precise as for components or materials, some sense of supply and demand is needed to understand whether measures are needed to expand or control the workforce.

A principal driver of industrial manpower requirements is the projected size of the Armed Forces. These requirements can have a pronounced impact on production and, in wartime, feasibility estimates can vary widely. For instance, agency planning estimates for calendar year 1943 (prepared during 1942) ranged from the War Production Board estimates (on which it based its production targets) of 7,600,000 men to

*Joint Committee, op. cit., pp. 11-12.

military estimates as high as 10,900,000.* Preparation of estimates is dictated by numerous assumptions:

- The number military planners consider necessary to carry out planned operations
- The number that can be trained and deployed in a given time period
- The number that can be supported and equipped
- The number needed for other uses (e.g., farm labor or industrial production).

Obviously, multi-agency planning activity is needed to generate these estimates, potentially involving the military departments, selective service, production agencies, transportation agencies, and many other agencies. Yet, the level of military manpower requirements, despite its obvious impact on the ability to perform other mobilization tasks, is likely to be one area which the military will regard as uniquely within its purview.

Manpower requirements are very sensitive to contracting levels and to contract distribution patterns. As discussed in Chapter 2, manpower has traditionally been a major bottleneck, but it was generally given inadequate consideration during plant siting and contract award decisions. Frequently, inadequate attention to manpower requirements led to severe local labor shortages.

*Fairchild, B. and Grossman, J., The Army and Industrial Manpower (Washington, Office of the Chief of Military History, 1959), pp. 46-49.

3.1.5 Fluctuation of Requirements

History suggests that requirements will fluctuate constantly, even after the conflict has begun. These fluctuations will be dictated by changes in strategy, unanticipated developments in combat, and other factors. In its 1944 Annual Report, the War Production Board (WPB) noted that requirements had changed considerably even relatively late in the war. Instances of fluctuation in requirements included:

- Increased requirements for 155mm and 240mm howitzers after 105mm howitzers were found to be ineffective against fortifications
- Increases in tire requirements for Army trucks after initial calculations were found to be erroneous
- Increased requirements for tracked amphibious craft, after the Navy learned that many lives had been lost in the Tarawa landing when landing craft ran aground on reefs far from shore
- Reductions in aircraft requirements due to lower combat losses and the maturation of new model production, which eliminated the need to keep old models in parallel production as a hedge against unanticipated production or performance failures in the new models.*

The WPB summarized the impact of these end-item requirements adjustments:

A rapid rearrangement of production lines was necessary to produce these new weapons. Furthermore, after the lines had been rearranged,

*War Production Board, op. cit., pp. 11-13.

it was imperative to increase production greatly so that the new weapons could be used extensively and at once to save lives by speeding the end of the war.*

The WPB also acknowledged indirectly another factor that reduces the precision and accuracy of requirements. It noted in its 1944 report that requirements had often been deliberately inflated in 1942 and 1943 "to give builders an incentive and to assure sufficient materials."[†] While this may have been a sound tactical approach to inspire contractors or to bargain for materials supplies, it clearly reduced the value of requirements plans and supported the need for a central coordinator of requirements with authority to enforce program decisions.

Technological improvements had a significant impact on requirements for electronic components and many other items. Connery indicates that:

During the course of the war, developments in the field of electronics, rockets, jet planes, and atom bombs made material requirements little more than guesswork.§

Because the war greatly stimulated scientific research that had waned before the war, this impact was very pronounced, and was felt almost immediately after the 1940 rearmament program began.

*Ibid., p. 11.

[†] Ibid., p. 13. See also Smith, L., American Democracy and Military Power (Chicago, University of Chicago Press, 1951), p. 222, on the same subject.

[§] Connery, op. cit., p. 89.

Product substitution, with accompanying changes in requirements, was caused both by new technological developments and by the need to find replacements for short-supply materials. For instance, during World War I, the U.S. developed new cotton fabrics to cover aircraft wings when it became evident that existing supplies of linen, the conventional material, would be inadequate.*

The difficulty of estimating component and material requirements has added to the end-item requirement problem. Unexpected product changes magnified the problem, as did the constant fluctuations in end-item requirements. These problems magnify the difficulty in pre-war requirements planning.

3.1.6 Coordination of Requirements

Requirements planning must account not only for the need and ability to produce military products, but also for civilian, infrastructure support, and Allied requirements. A requirements coordination mechanism must be established for all of these requirements. Failure to control these requirements has caused inefficiencies and conflicts in past mobilizations, and failure to centralize control limited the effectiveness of the production arbiter.

Civilian Requirements - The U.S. has always waged "guns and butter" wars to one extent or another. Although consumer durable goods were substantially curtailed in prior mobilizations, and some consumer products were in short supply.

*U.S. War Department, America's Munitions 1917-1918, Report of Benedict Crowell, Assistant Secretary of War (Washington, Government Printing Office, 1919), p. 247.

the non-defense economy has never been extinguished. Substantial non-defense production is necessary to support the war effort (e.g., farm equipment, repair parts), and even some "luxury" items are considered necessary for homefront morale. As an index of resources devoted to non-defense uses, labor force comparisons between April 1940 (immediately before the beginning of serious rearmament efforts) and September 1943 (the peak military production) show increased 1943 employment in agriculture, non-munitions production, transportation and public utilities, construction, and trade and service sectors.* Plans must provide for generation and coordination of these requirements.

Infrastructure Requirements - Infrastructure requirements are derived in part from military requirements, but they represent a separate subset. In past mobilizations, they have represented a difficult coordination problem. For instance, in World War II, although the War Production Board was empowered to control production and materials allocations, the authority of the WPB was seriously undermined by establishment of independent commodity or functional "czars," with arguably equal authority, within their own sphere, to WPB Chairman Donald Nelson.

Commodity or functional czars were established for individual resources, such as petroleum, rubber, manpower, and food. Generally strong individuals with their own political

*U.S. Congress, Legislative Reference Service, Mobilization Planning and the National Security (1950-1960) -- Problems and Issues (Washington, Government Printing Office, 1950), p. 211.

supporters and constituencies,* they frequently viewed their responsibility as being to make the strongest possible claims for resources for their programs, and to allow a senior authority to settle these claims. Because WPB Chairman Nelson was regarded as a peer, not the final authority, these conflicts often surfaced publicly, with the press, industry, and congressional committees all taking sides and demanding a solution -- which sometimes took the form of reorganizing government agencies or appointing yet another "czar." None of these activities facilitated consideration or coordination of their requirements.

Allied Requirements - Allied support requirements will also be critical. Requirements for U.S. production to support Allies have always been high. Table 3.1-1 shows the scale of allied support provided in World War II for the British Commonwealth alone as a percentage of output. Co-production agreements, offsets, the flight of American industry offshore, and the NATO mutual support concept all suggest that there will be requirements for U.S. production to support other nations, and, possibly, for allies' production to support the United States.

Most authorities agree that a principal failing of pre-World War II coordination agencies such as the National Defense Advisory Commission and the Office of Production

*For instance, economic stabilization administrator James F. Byrnes was a former U.S. Senator and Supreme Court justice, and was later to serve as Secretary of State and Governor of South Carolina; manpower commissioner Paul V. McNutt had been Governor of Indiana, and was often mentioned as a possible 1944 Presidential candidate; rubber "czar" William M. Jeffers was president of the Union Pacific Railroad; the food and petroleum "czars" were serving, at the same time, as Secretaries of Agriculture and the Interior, respectively.

TABLE 3.1-1
UNITED STATES LEND-LEASE SUPPLIES TO THE
BRITISH COMMONWEALTH AS A PERCENTAGE OF TOTAL
UNITED STATES PRODUCTION

	1942	1943	1944	1945*
Aircraft and equipment	12.4	11.9	13.5	11.8
Ships, equipment and repairs	5.5	11.8	6.7	5.4
Ordnance and ammunition	10.4	10.0	8.8	4.6
Vehicles and equipment	9.8	26.7	29.4	12.1
All munitions	7.6	11.2	11.7	7.6
Foodstuffs	4.3	4.4	5.4	3.9
Other agricultural produce	4.3	5.6	4.4	5.0
Machinery	2.6	5.7	7.1	4.2
Metals	3.9	4.2	3.4	3.5
Other manufactured goods	0.7	0.6	1.1	0.7

*Six months

SOURCE: Allen, R.G.D., "Mutual Aid Between the U.S. and the British Empire, 1941-5," in J.R.S.S., No. 109, 1946, p. 258, as cited in Milward, Alan S., War, Economy, and Society 1939-1945 (University of California Press, Berkeley and Los Angeles, 1977), p.72.

Management was their inability to provide comprehensive requirements and, consequently, their inability to control all claims on production resources. The coordination nightmare that existed in the period immediately before the war, when all-out rearmament was under way and shortages were already being felt, is illustrated in the following:

One factor in particular brought about a partial reorganization, and that was the necessity of meeting foreign requirements. Whereas military production was the charge of Mr. Knudsen,* and civilian supply was the domain of Mr. Henderson,† there was no single

*William E. Knudsen, Director of the Office of Production Management.

†Leon Henderson, Director of the Office of Price Administration and Civilian Supply.

agency capable of balancing the needs of the American economy as a whole against the needs of the Allies.*

Contention among these claimants was continuous during the pre-war rearmament, and lasted throughout World War II. The military generally took the view that its needs should be satisfied first, and that all other needs should be secondary. Lend-Lease support for Russia, in particular, was opposed by many, especially when it was perceived that it might delay production for U.S. forces.

The problem that lack of coordination can cause is illustrated by one post-war study:

The difficulty of obtaining advance programs of requirements was heightened by conflicts among the agencies responsible for supplying WPB with data regarding foreign requirements. For many months, the Board of Economic Warfare, contending that its Presidential order gave it world-wide jurisdiction, prepared requirements programs for all foreign countries. During this same period the Lend-Lease Administration submitted programs covering foreign requirements to be financed by lend-lease funds. It left out of its calculations, however, those requirements of predominantly lend-lease countries that were to be handled as cash purchases, and its coverage of even lend-lease purchases of Latin American countries was indifferent. Meantime, the Board of Economic Warfare screened the non-lend-lease requirements of Latin American republics. The result was confusion, and there was constant uncertainty as to whether Latin American lend-lease requirements were reported by the Board of Economic Warfare, the Lend-Lease Administration, neither, or both.†

*Connery, op. cit., pp. 104-105.

†Civilian Production Administration, op. cit., p. 341.

Coordination of Allied requirements is probably even more important now than in the past, with the growing global interdependency. This historical reality suggests the need for a major change in national policy. (For example, Memoranda of Understanding similar to those we have with South Korea may need to be broadly extended.)

In World War II, failure to settle the requirements-coordination responsibilities of various agencies was symptomatic of a broader organizational failure. If this issue is not settled, control of resource management programs in general will be similarly disordered.

3.2 IMPACT OF RESOURCES ON STRATEGY

As demonstrated, military strategies clearly have an important impact on production and resource requirements. The scale of strategic requirements largely dictates the degree of resource management required. However, the reverse is also true: the availability of resources can have a significant impact on the ability of military forces to carry out strategies. It is this fact, perhaps more than any other, which dictates the need for strong, centralized civilian resource management.

In the early stages of mobilization, resource limitations are more likely to be imposed by external constraints -- e.g., the absence of adequate resource management plans, the reluctance of industry to convert, or funding limitations. Subsequently, resource limitations will take the form of production delays and bottlenecks. The inability to convert the economy overnight will restrict initial output of military end items even though sufficient resources will exist to

provide this increased production. In the latter stages of an all-out mobilization, some resources may reach their practical limits. The need for essential infrastructure support, the interrelationship between indirect support industries and direct production industries, and the need to meet Allied and essential civilian requirements all add to the demand and reduce the ultimate level of production available for military demand once these limits are reached.

Throughout World War II, resource constraints limited the military expansion. Prior to the war, Allied lend-lease production displaced some production for the U.S. military and limited the pace of the military build-up. In the first few months of U.S. involvement, the absence of conversion plans delayed increases in production and permitted continuing non-essential production. Once war began, resource limitations meant that the United States could not fully support a two-front war, causing allied leaders to stress a "Germany-first" policy. Requirements for one production program (e.g., heavy bombers) affected the ability to meet other programs, and efforts to expand capacity (e.g., rubber and petroleum) for future production required resources which could otherwise go into current production. The need for time to produce and deploy sufficient forces dictated an invasion of Europe in 1944 rather than 1943, and supply and transportation inadequacies (mainly unrelated to U.S. production capability) slowed, and ultimately stopped, the U.S. Army's breakthrough in the summer of 1944. Throughout the war, inadequate attention to plant siting and contract distribution issues caused manpower shortages (which limited production) and labor migration (which required expenditure of resources on housing, schools, transportation and other services in over-crowded areas).

All of these conflicting priorities and resource shortages required a requirements review and approval mechanism. During the war, a mechanism was established to permit the War Production Board to review and adjust proposed military requirements each year. For instance, in 1942, the War Department's proposed 1943 military production program was estimated by the WPB staff to cost slightly in excess of \$92 billion; only \$75 billion in direct military production was considered feasible, given other requirements and the limits on the production build-up (planners were then facing the near-certainty of a shortfall in meeting 1942 requirements). WPB planners argued that requirements far in excess of resources could virtually destroy any efforts to coordinate production. Ultimately, after prolonged discussion between the War Department and the WPB, the production goals were reduced to \$80 billion.*

All of these resource limitations provide fertile ground for conflict between the military and the resource manager. Especially before the ultimate limits of the economy are reached, it appears to the military that more could be done given sufficient will and discipline. Thus, the potential is established for continuous battling over these requirements and, for that matter, over who has authority to establish them. (These conflicts are discussed in Section 6.3.1.)

3.3 SUMMARY

In summary, there are several important historical lessons which apply to peacetime mobilization requirements

*Civilian Production Administration, op. cit., pp. 282-292.

planning. First, requirements planning must be flexible. No single set of requirements can possibly cover all contingencies. (Current national planning does not even provide definitive requirements for a single contingency because Allied and civilian aspects are not properly considered.) Requirements generated in peacetime may be too high or too low, or they may just be for the wrong items. The margin of error is increased by the likelihood that end-item requirements will fluctuate even during wartime and that substitute end items, components, or materials will change requirements further.

This experience does not suggest that peacetime requirements planning is without value. On the contrary, it would be difficult to generate peacetime preparedness plans without establishing some requirements context. However, the resource management planner should be aware of the uncertainty inherent in military requirements generation, and should prepare his own resource management plans with as much flexibility as possible. Civilian resource management planning should stress capacity to meet as broad a range of requirements as possible.

While end-item requirements are necessarily imprecise, component and material requirements per unit need not be. Planning based on end item bills of materials can show overall materials demands for any proposed production program, and can aid the resource management planner in determining what level of production could cause materials shortages or bottlenecks and at what point these increasing requirements will require additional resource management actions.

Planning for requirements should give some attention to civilian requirements and should show the impact of military production increases on civilian production. While these

requirements will probably be as imprecise as military end-item requirements, comprehensive, consistent plans (to whatever degree of precision they are prepared) are needed to show the multiple claims which might be placed on individual producers and industries, to estimate capacities easily convertible to defense production, to identify conversion or expansion candidates, and to suggest what levels of military procurement might require increased resource management activities.

Requirements plans must be flexible enough to permit selective or partial implementation. Vietnam and Korea are both examples of conflicts which stressed only a portion of the production and resource base. In these cases, different portions of the resource base would require resource management actions. End-item and component requirements, and the intensity of accompanying resource management programs, would be very different in a Korean scenario or a Southwest Asia scenario, to mention only two examples, as compared to a European scenario. The limitations that resource availability puts upon capacity, and therefore upon strategy, must also be considered.

4. METHODS FOR CONTROLLING AND ALLOCATING RESOURCES

In past industrial mobilizations, resource allocation issues have played a central role in the military buildup. In a fully mobilized economy, prices no longer allocate resources among competing demands. Strategic requirements and resource availability, not market forces, determine production and distribution of goods. To mobilize the economy, the government must implement priority systems, material controls, and other resource management policies to direct the flow of resources to defense production. Measures to constrain civilian demand may also be necessary including curtailment, rationing, or price intervention. Balancing civilian and military requirements is also necessary. The higher the military demand becomes, the more extensive these measures must be.

4.1 GOVERNMENT INTERVENTION

Past industrial mobilizations suggest that the methods the government employs to direct the flow of resources to the production of military equipment must be proportional to the increasing scale of strategic requirements. The government is compelled to intervene more extensively in the economy as procurement requirements escalate. This intervention is needed both to ensure coordination and orchestration of production and to control possible resource shortfalls.

When the government fails to control sufficiently the flow of resources to essential civilian requirements and the most important military demands, critical shortages can develop

throughout the economy. On the other hand, too much government intervention in the economy can lead to inefficient allocation of inputs, overexpansion, and needless diversion of resources away from the civilian economy. Ultimately, excessive intervention can threaten the political consensus on the military program. As they are needed, a broad range of resource management options is available, from essentially no control to virtually total control of the economy.

4.1.1 Below the Threshold Mobilizations -- The Example of Vietnam

In Vietnam, the government sought to minimize the impact of the war on the lives and living standard of the American people by procuring weapons systems and other equipment with little modification of peacetime procedures. No new Federal agency was established to coordinate the mobilization of industry. The President never sought extraordinary powers to organize the economy for defense production.* Even the Defense Priorities System (DPS) -- the first line of defense in industrial mobilization planning -- was used only in a limited way. The top priority "DX" rating was sparingly granted to Vietnam-related orders, even though some items were in short supply.

*As will be discussed in Chapter 6, this "business as usual" approach can also be attributed, in part, to the increased capability of the existing government structure and legal authority base to accommodate such activities. The existing administrative structure was significantly more capable than it had been in the past, and the existence of the Defense Priorities System permitted a greater degree of control of production than was permitted at the outset of prior mobilizations. In a sense, this existing government structure permitted the significant production increases -- through use of order boards, delivery directives, and similar methods -- while keeping the government postured on a "business as usual" basis.

The war in Vietnam did not require the full mobilization of the nation's industrial resources, as production rates increased sharply only for only a few items, primarily helicopters, some fighter and attack aircraft, ammunition, and bombs. These items were consumed rapidly because of the nature of the conflict and the emphasis on aerial bombardment. Requirements for these items were met by surging production in existing plants, such as helicopter assembly plants, rebuilding iron bomb plants, reactivating government-owned ammunition factories, and placing ammunition contracts with private producers. Requirements for some items were also met, in part, by drawing down U.S. stockpiles in Western Europe, rather than increasing production rates. Because of the limited nature of the Vietnam buildup, this "business-as-usual" approach to industrial mobilization proved relatively successful, at least in a narrow sense that procurement targets were largely met, and lead times were maintained at acceptable levels.

Despite the fact that the industrial base succeeded in fulfilling military demands during the Vietnam war, the "business-as-usual" approach to mobilization may have contributed to the long-term deterioration of defense capabilities. Increased funding for the war was accompanied by a deferral of modernization. Following postwar defense spending cuts, it was impossible to make up all of these shortages and the modernization problems continued throughout the 1970s. The credibility of the industrial preparedness program also suffered due to the "business as usual" decision to procure supplies through normal channels rather than activating planned emergency producers, thus eliminating a principal reason for companies to participate in the program.

The Vietnam war decisions also had a clear negative impact on U.S. force readiness elsewhere in the world. The Johnson administration consciously decided to support early consumption requirements out of existing inventories. In July 1965, when troop commitments stood at only one-sixth of ultimate deployment levels, Secretary of Defense Robert S. McNamara noted that about one-half of all Army helicopters were deployed in Vietnam.* Stockpiles were rebuilt slowly, if at all, because of pressures to restrain non-Vietnam defense spending. Defense cutbacks after the war continued to delay readiness improvements.

The Johnson Administration decisions to fund both the war and the Great Society to as great an extent as possible, and to avoid direct economic controls, also contributed to increased budget deficits and, in the minds of some economists, contributed to the inflation which plagued the economy in the late-1960s and early-1970s (although the oil shocks and food price increases, unrelated to federal spending levels, clearly had a much greater impact on the later double-digit inflation rates). Even a relatively low-level conflict such as Vietnam should have forced choices on the federal government -- more guns or more butter -- which the federal government at that particular time was reluctant to make. The result -- an attempt to satisfy all priorities to some extent -- yielded unsatisfactory results and risked substantial economic damage.

Given the political decisions made at the time, military demands during the Vietnam conflict appeared to have

*Berman, L., Planning a Tragedy: The Americanization of the War in Vietnam (New York, W.W. Norton and Co., 1982), pp. 124-125.

been below the threshold that would have made it necessary for the government to reorganize the economy for defense production. The increased capability of the government to handle significant production increases clearly helped make this strategy possible. Nevertheless, the Vietnam experience demonstrates that avoiding the short term economic and political costs of mobilization can have a negative impact on military readiness and preparedness. Further, although the risk during Vietnam was more apparent than real, such economic decisions can risk substantial harm to the economy should military requirements escalate well beyond projected demands and beyond the capabilities of existing resource management systems.

4.1.2 Limited Intervention -- World War I and Pre-World War II

In the initial stages of industrial mobilization for both World War I and World War II, military requirements appeared sufficient to justify some government intervention in the economy, although little political support existed for extensive government controls. In both cases, the government established a system of priorities to ensure that military orders were placed at the front of the queue. However, only limited efforts were made in either case to curtail civilian production or divert basic materials from non-defense producers to fulfill military demands.

Especially in the initial stages of preparation for World War II, the uncertainty about eventual U.S. involvement limited the effectiveness of resource management. The country was seriously divided in its approach, and these divisions were especially evident in the uncertain nature of procurement, civil production curtailment, and resource management decisions.

Bernard Baruch characterized production priority systems as the "synchronizing force" of industrial mobilization. Priorities indicate which orders should be produced first, and they set the pattern for the distribution of raw materials, labor, components, transportation, energy, and other resources.

A priority system brought order to the initially chaotic World War I mobilization effort. Three months after the U.S. entry into the war, the War Department and Navy Department swamped the economy with orders for military items -- an economy already running at a very high level due to foreign supply orders and associated general prosperity. Industry was given no indication of which items were most important. Producers of critical items were often unable to acquire needed materials. Production logjams developed, inflation soared, and transportation problems developed.*

During the initial stages of the World War II industrial mobilization, defense procurement represented a relatively small portion of national output. Preference ratings were sufficient to resolve conflicts in the use of manufacturing facilities and to identify the items to be produced first. This experience suggests that priority systems can help guide the flow of resources toward defense procurement as long as the supply of vital resources does not fall far short of total wartime demands. In the initial stages of an emergency, a simple priorities system can guide mobilization until more elaborate institutions are required.

*Huston, James A., The Sinews of War: Army Logistics 1775-1953 (Washington, Chief of Military History, 1966), pp. 317-319 and 342-345.

4.1.3 The Government-Managed Economy -- World War II and Korea

After the attack on Pearl Harbor in December of 1941 and the U.S. entry into World War II, procurement targets for weapon systems increased sharply. Acute shortages of machine tools and construction equipment developed rapidly, and soon thereafter, basic metals became increasingly scarce. Indeed, in the absence of a strong coordinator, severe shortages began to appear prior to Pearl Harbor as production built up. As mobilization progressed and manufacturing facilities, materials, and manpower became increasingly scarce, the priority system failed to coordinate escalating demands for critical resources. As program officers attempted to meet the military requirements, more and more orders were granted high priority status. This practice undermined the system's ability to identify the most vital orders and caused middle- and low-rated orders to go unfilled. In such circumstances, the government had to wield greater control over the economy to ensure that crucial military requirements were met.

The failure of the priority system led to a series of government measures designed to extend controls over the nation's economy. The Controlled Materials Plan (CMP) allocated steel, copper, brass, and aluminum to the producers of military items. Because these materials were widely used throughout the economy, and were in the shortest supply initially, the CMP gave the government the power to exercise more complete control over production. (See Section 4.2.2.)

As a result of the government's efforts to curtail non-defense production, shortages of civilian goods appeared throughout the economy. Industrial mobilization both increased

the pool of money and reduced the quantity of goods -- especially durables -- available to consumers. In 1941, the voluntary price agreements negotiated between the government and industry and trade associations during the early stages of the mobilization crumbled under mounting inflationary pressures. The cost of living soared. In January of 1942, Congress approved the Emergency Price Act, which provided the Office of Price Administration with the authority to maintain rents and force retailers, wholesalers, and manufacturers, to maintain prices at the March 1942 levels.*

Rationing became a widely-used instrument of economic stabilization and resource management. Gasoline was the subject of stringent controls, partly to save fossil fuel for the war effort, but more importantly to conserve private automobile tires. The newly created rubber industry and available manufacturing capacity for the production of tires were needed for military vehicles and aircraft.[†] Sugar, meats, and butter were rationed to ensure an equitable distribution of scarce basic foodstuffs. Coffee also was rationed, because importing it from South America required merchant ships that could otherwise be used to carry military production-related items. Many processed foods were diverted from the civilian economy partly to save the tin in metal cans for war production and partly to supply canned foods to the military.[§]

*Abrahamson, James L., The American Home Front (Washington, National Defense University Press, 1983), p. 141.

†Nelson, Donald M., The Arsenal of Democracy: The Story of American War Production (New York; Harcourt, Brace, and Co., 1946), pp. 295 and 302-304.

§Abrahamson, op. cit., p. 142.

Government controls extended all the way down to the factory. Plants were told what they could and could not produce. At times, the government even controlled individual plant order boards and determined precisely which orders would be filled first.* The government re-trained workers, particularly women, to operate the government-built factories. In December 1941, the government negotiated a "no strike" pledge with the American Federation of Labor and the Congress of Industrial Organizations, leading union organizations. In return, the government established a National War Labor Board to settle all wage demands, and imposed a limit on annual increases in hourly wages. (However, strikes continued at pre-war rates throughout the war.) Sporadically, the government employed even more dramatic methods to sustain the war economy. In 1943, a national coal strike led to the temporary seizure of the Eastern coal mines.†

The U.S. Government was forced to adopt extraordinary controls over the U.S. economy to meet the massive military demands posed by its entry into World War II. Early efforts to mobilize the economy for war production without imposing stringent economic controls risked chaos in the period from 1940 through 1942, and may have delayed the dramatic increase of output that was finally achieved in 1943 and 1944.

In the Korean War, many of the same techniques used in World War II were again applied. Although the war did not approach the dimensions of World War II, the resource management effort paralleled the earlier experience in many ways.

*Novick, David, Anshen, Melvin, and Truppner, W.C., Wartime Production Controls (New York, Columbia University Press, 1949) pp. 268-286.

†Abrahamson, op. cit., pp. 142-145.

Especially significant were government initiatives to expand production capacity. This "disproportionate" effort was considered desirable for several reasons:

- The U.S. increased production to a greater degree than the limited Korean conflict required, to deter or prepare for a feared worldwide, general war
- Significant expansion was necessary because many industries, unlike the period preceding World War II, were operating at or near capacity, leaving little idle capacity for defense
- The Truman Administration was reluctant to impose austerity measures on a population which, having weathered the Depression and World War II, was enjoying a long-delayed "spending spree." For this reason, significant government-funded expansion was preferred over austerity measures.

In this instance, the government supported major expansions of basic industrial capacity, converted producers, curtailed some civilian production, enforced priorities systems, allocated critical materials, imposed inventory controls, limited prices, rents, and wages, and applied a broad range of resource control measures.*

During the Korean War, the resource management approach was exactly the opposite of the approach taken in the Vietnam War. Instead of minimizing the apparent economic impact, the Truman Administration took the more difficult course of planning for the worst. As with Vietnam, this approach was

*U.S. Office of Defense Mobilization, "Building America's Might," contained in Joint Committee on Defense Production, U.S. Congress, Progress Report No. 7 (Washington, Government Printing Office, 1951), pp. 352-356.

not without risk. In the case of the Korean War, this action, in the face of a limited and relatively unpopular war, aroused opposition to the controls program and, ultimately, to the war effort itself. Thus, this conflict represents the opposite hazard facing the resource manager planning for limited war.

4.1.4 Summary

A brief survey of past mobilizations suggests that nations may obtain moderate increases in defense production without imposing extensive controls on the civilian economy. Relatively inobtrusive resource management tools -- such as priority rules for military orders and tax policies that encourage industrial expansion for defense procurement -- may suffice when military demands increase slightly, or rise dramatically only for a few items. In some conflicts, as in Vietnam, the industrial base can fulfill military requirements employing essentially peacetime procedures.

There is considerable middle ground between the "business-as-usual" approach to industrial mobilization and the practice of controlling virtually all facets of the economy. Notably, when industrial mobilization consumes a relatively minor part of the total economy, a priority system for military orders may be sufficient to minimize or eliminate bottlenecks and to ensure that the most important military items are produced first. In this environment, problems can be dealt with on an "exception" basis within the framework of peacetime agencies.

However, when military demands rise sharply, or when there is little slack in the economy (i.e., when output of more military items creates severe resource scarcities), the government is compelled to direct critical resources toward

the production of the most important military items. The government exercises control over the economy by allocating basic materials, authorizing the construction of additional manufacturing facilities, and implementing economic stabilization measures to control inflation and allocate scarce civilian goods. (Specific expansion and conversion measures are considered more extensively in Chapter 5.)

While total government control represents the greatest stress on society, it is probably not the most difficult resource management challenge. Techniques for exercising total control of the economy are fairly well documented. Methods to expand capacity, to convert industry, and to control resources can be adapted from history and taught to a new generation of resource managers. Novick, et al., contend that total resource management is mainly a matter of technique, an essentially correct observation. This is not to imply that these problems are easy; experience shows that development and application of resource management techniques will cause numerous political conflicts and controversies.

However, from the viewpoint of resource management policy, a much more difficult problem is posed by the less-than-total approaches. Transitions between one form of controls and another will be difficult, especially when the situation is ambiguous (e.g., immediately before Pearl Harbor) or where society is divided as to war aims (as in the Korean and Vietnam wars). The resource management planner must strike a balance between over-control and insufficient control. Overcontrolling the economy can lead to inefficiency and, as was the case in the Korean War, can exacerbate political conflicts about the war itself. Insufficient control can reduce the pace of the military buildup, reduce overall force readiness, and contribute to materials shortages, hoarding, and runaway inflation.

4.2 METHODS TO CONTROL RESOURCES

The range of tools available to provide government control over resources corresponds to some degree with the scale of mobilization. The potential range extends from simple priorities and persuasion to plant seizures and "labor drafts." The actual range available to the resource manager depends to a large degree on the size of the strategic requirement, the perceived amount of time available, and the political atmosphere in which the manager is operating. There is a logical flow of resource management methods, which is best illustrated by the U.S. experiences in World War II, our closest approach to "all out" mobilization. In the paradigm of a capitalist economy, a chief limiting factor on all options is the dictum: "the less control, the better."

4.2.1 Priorities Systems

Placing priorities on military orders enables the producers and procurement officials to measure the relative urgency of need for the items. The current Defense Priorities ("DO-DX") System has been in use since 1950 and can, when enforced, allow for shortened production schedules by reducing queuing time for military products. In low level "mobilizations," vigorous enforcement of this system can be sufficient to meet Defense needs by making military orders the first to be produced over competing civilian or lower-rated military orders.

However, more vigorous controls quickly become necessary when excessive high-rated demands cause the system to lose effectiveness. Donald Nelson addressed the question in this way:

A simple priorities system works well enough if, to begin with, the raw materials which are put under control are only relatively scarce - in other words, if there is almost enough of the scarce commodities to go around. In such a case, the man with a low rating will still get the stuff he needs, and he will get it with reasonable promptness. But when the shortages become acute ... the priorities system begins to slip. Priority ratings tend to depreciate as paper money does in a period of inflation; it takes higher and higher ratings to get any kind of delivery at all, and finally the whole system fails to provide the control that must be maintained.*

The initial system established by the Army-Navy Munitions Board (ANMB) in World War II had ten categories of "A-ratings" (military items) plus a double A for emergencies. Even within this relatively elaborate system, however, orders tended to escalate to the highest category. Soon the A-1 category had to be subdivided into ten subcategories. The AA category eventually had five subcategories of its own. A triple A category was developed for emergency production. Although such a category was not part of the original system, over 60,000 AAA orders were placed during the war.[†]

The World War II priority ratings, even on a very narrow scale, created an immediate problem. Current government contractors were reluctant to accept preference-rated orders because the "liquidated damages" clauses of most government contracts provided for a financial penalty if the contractors did not deliver on time. Deferring existing

*Nelson, op cit., p. 155.

[†]Smith, R. Elberton, The Army and Economic Mobilization (Washington, Chief of Military History, 1959), pp. 507-543.

orders to accept a preference-rated order could penalize the acceptor. The President eventually ordered all government agencies to waive these clauses.*

One important additional question was whether or not to cascade the assigned priorities down the production tiers. Due to their previous planning experience, the services and the ANMB were very much in favor of cascading priorities down the vertical tiers. In this process, the services would assign the priority to the end-items at the prime contractors and they, in turn, would assign the same priority to all subcontractors, suppliers, and providers of support items (such as machine tools). These individuals would assign the same priorities to their orders to support the contract on down the chain to raw materials. Other agencies opposed this prior to the actual outbreak of war.[†] The priorities system eventually was extended throughout the economy, but cascading was limited.

The system had difficulty at first because it was voluntary. In 1941 the system became mandatory, removing customer pressure on producers to ignore the ratings. However, preference problems were already cropping up between various military orders. Many unanswered questions began to arise:

- Should a manufacturer, upon receipt of a higher rated order, cease production immediately on items halfway through the production process? If he did, much time in organizing and setting up production lines would be lost and overall defense production would suffer

*Ibid., p. 511.

[†]Ibid., pp. 530-531.

- Moreover, if such displacement were made mandatory, what guarantee of completion would the new order have if it were displaced in midprocess by a still higher rating
- In the case of orders for identical items could a new, higher-rated order preempt units already completed but still undelivered
- Would customers under lower ratings have to see their orders processed from the very beginning after each preemption?

Resolution of such issues is vital to orderly production of military items. In World War II, the Army took steps to prevent the "piracy" of completed units and the repeated displacement of lower-rated orders. Interruption to previous orders was permitted only when the actual required delivery of the supplanting order could meet the test of military urgency.* These actions eased the problem somewhat. However, priorities could only do so much in a situation that involved across-the-board shortages. The difficulties increased when OPM entered the picture with another rating system for nonmilitary orders. Included in the OPM system were orders to support military production where the producer could not get an extension of a military rating, e.g., lower tier items, such as screws, nuts, bolts, etc.†

Another problem posed by the relatively simple preference-priority system is that non-military orders may be excluded. A simple "most urgent," "urgent," and "all other" system would be overwhelmed in any large scale mobilization both by its relative simplicity (leading to the previously

*Ibid., p. 537.

†Ibid., pp. 538 and 515-517.

noted priorities inflation) and by the need to provide for production of non-military items. A simple priorities system can cascade through a defense program's market structure to reach component and support equipment suppliers (e.g., machine tools for defense equipment), and can also prioritize allied support requirements, but it cannot, without modification, support production of essential civilian supplies. Because of the need to continue (and, in some cases, perhaps expand) certain non-military production, further measures become necessary.

Ultimately, the problems with "allocating shortages" would be straightened out by the War Production Board. The first WPB attempt was a horizontal effort, the ill-fated Production Requirements Plan. The second attempt was modeled on the successful allocation system developed by Ferdinand Eberstadt, Chairman of the ANMB, for machine tools (a system modeled, in turn, on British control methodologies). This much more successful effort was the Controlled Materials Plan.

4.2.2 Material Controls

By the spring of 1942, previous civilian agency rating systems for common items had proven to be ineffective for allocating increasingly scarce materials to the most important military programs. The scarcity of resources undermined the preference ratings; virtually all orders were granted top priority status. Lower-rated orders were never filled, leading to underproduction of tentage and other mundane but important items.

The principal allocation technique used by the government, once overall demand exceeds available supply, has

been material controls. In June 1942, the War Production Board established the Production Requirements Plan (PRP) for allocating materials throughout the economy. Each manufacturing establishment was required to submit a quarterly application to the WPB for the basic metals it would need to sustain production. The preference rating system (priorities) would remain in force, but only as a means of determining precedence in delivery, not the allocation of resources. The paperwork generated by the PRP was introduced on too short a schedule and was an administrative nightmare. However, a more fundamental flaw was the failure of the plan to relate the allocation of resources to the procurement decisions of the military. The system provided little visibility, on a program-by-program basis, as to how reductions in supply of one material would affect requirements for other materials. The WPB could not identify how the distribution of basic metals affected the delivery schedules of completed systems, nor could program managers correlate cutbacks in different materials. The PRP failed because it provided no link between end items and scarce resources.*

The Controlled Materials Plan (CMP) was introduced in July 1943 to coordinate the allocation of materials with procurement programs. The materials selected for direct control were those metals that were used in most military equipment and, therefore, subject to widespread shortages throughout the economy -- carbon and alloy steel, copper, brass, and

*Ibid., pp. 558-563.

aluminum.* The CMP was a major step in ensuring that the most important orders received sufficient supplies of basic metals. The WPB estimated the amount of each metal used in the manufacture of naval vessels, aircraft, and other military and civilian requirements. A stream of paperwork flowed up through all producers in each program estimating their demands, plant by plant, for each controlled material. The Board divided the supply of the controlled metals among the procuring agencies, according to the importance of each program to the conduct of the war. The CMP allowed the WPB to guide the flow of resources toward the most important military programs. Together with government-funded expansion of metal producing capacity, allocation of these materials helped make possible the dramatic boosts in output obtained in 1943 and 1944.[†]

Material controls were successful in World War II because the principal materials in short supply throughout the economy were the same ones in very high demand for military programs -- copper, aluminum, and steel. The current allocation system is based on these same materials. However, the coincidental overlap of military and overall economic demands

*This point is especially important for present-day planners. Present allocation programs are described as providing control over those materials most widely used in the economy (steel, aluminum, copper, and nickel alloy). Thus, the resource manager can exercise basic control over the entire economy through DMS controls. While the CMP materials were indeed those materials used widely in the economy, the 1944 WPB annual report makes clear that these materials were brought under control because they were in shortest supply. Specific controls of short-supply materials were considered necessary. This distinction is critical to the resource management planner because a future wartime resource allocation program built around materials in short supply probably would have little resemblance to the present-day allocation system.

[†]Novick, et al, op. cit., pp. 163-193.

may no longer exist. In actual fact, this control system worked well in World War II because war-related production demands began to wind down as other aspects of the economy, e.g., the labor force, began becoming increasingly serious bottlenecks.

4.2.3 Other Resource Management Methods

Beyond the use of priorities and allocation systems, the following methods have been applied to expand military production and to manage the flow of resources:

- Curtailment of non-defense production
- Scheduling of production
- Requisitioning.

Curtailment - Curtailment of some commercial production began well before Pearl Harbor. For instance, in 1941, major automobile manufacturers were first encouraged, and then ordered, to reduce their production schedules. Initial curtailment efforts were undertaken more with a view to conserving raw materials being used in non-essential production, and less for the purpose of promoting conversion of the curtailed production facilities. However, almost immediately a problem began that plagued the rearmament program until the end of the war. Military orders did not automatically match production curtailments, leading to "priorities unemployment." The problem of contract distribution to sources with otherwise-idle machinery and workers was never solved, as the military showed a continuing preference for established procurement channels. However, before the war, priorities unemployment also was caused simply by the slow pace of military order placement.

The problem led to significant controversy between the Office of Production Management and the War Department. The military took the view that civilian production should be curtailed whenever possible, merely to make resources available for military production. OPM, on the other hand, tended to support the view of businessmen that "there was no point in creating a vacuum by drastic curtailment" without corresponding increases in military production.*

The prolonged debate over automobile curtailment orders probably exacerbated materials shortages, because automobile manufacturers "acted on warning" and used their market power to increase materials inventories to expedite pre-curtailment production. Pressure continued for more curtailment to facilitate increased war production, but ultimately the problem was not resolved until after Pearl Harbor, when it became evident that massive curtailment and conversion were necessary.

Ultimately, many other consumer products were curtailed, including refrigerators, washing machines, electric irons, typewriters, and telephones. Some curtailments were partial, while others were highly selective (e.g., use of steel springs was prohibited in new furniture for more than a one-year period).†

However, curtailment and conversion proceeded slowly. A postwar study notes:

*Civilian Production Administration, op. cit., pp. 192-194.

†War Production Board, op. cit., pp. 102-103.

WPB really had no studied and balanced group of conversion policies that it could put into effect. No formal statement of conversion policies was ever adopted by WPB, although in March 1942 when the conversion program was faltering, Nelson came close to adopting certain drastic policies for all-out and immediate conversion suggested to him ... If anything was characteristic of conversion in the period from January until mid-March and more, it was the quality of improvisation.*

The study notes that consumer durable-goods production curtailment was not extensive through March 1942, the fourth month of the war. Policies and pre-war plans to expedite conversion had not been effective.

Scheduling - By late 1942, non-essential civilian production had largely been curtailed, and was no longer a bar to production. Correspondingly, there was little more to be gained through simple curtailment. For a period of several months, production virtually plateaued. Production increases, after averaging 13 percent per month in the first seven months of 1942, tapered off to 4 percent in the next three months.[†] The limits of simple priorities and curtailment had been reached.

Moreover, many basic materials shortages had been solved, or were on their way to solution. As noted in Section 2.3, bottlenecks were flowing through the manufacturing process. As one postwar study noted:

For many vital programs, components were relatively more scarce than materials. Thus, for

*Civilian Production Administration, op. cit., pp. 313-314.

[†]Ibid., p. 509.

example, there might be ample supplies of steel for all the ships to be built for a particular quarter, but insufficient valves or motors. Forgings, boilers, gages, heat exchangers, turbines, blowers, pumps, and bearings were equally necessary for ships and the manufacture of airplanes, for rubber factories, and the production of farm machinery. Unless the production of components was carefully scheduled, and unless the components themselves were distributed against immediate need, proper allocation of raw materials did not prevent bottlenecks in production.*

Because of the limitations of existing resource management programs, scheduling was necessary.

This stimulated another round of turf battles and recriminations between WPB and the Services, but ultimately a workable scheduling mechanism was developed. According to one postwar study, scheduling involved three critical elements:

- "Sitting down with the military chiefs, reviewing their programs, contracts, and production schedules, and requiring them to make adjustments designed to get a better overall result
- "Sitting down with the managers of plants which were producing the important military products, and authorizing or directing them to take the necessary action in their own plants to get out maximum production regardless of contracts, or the demands of individual procurement officers and their expeditors
- "Taking more or less complete control of the production schedules and deliveries of the manufacturers of intermediate

*U.S. Bureau of the Budget, Committee of Records of War Administration, The United States at War - Development and Administration of the War Program by the Federal Government (Washington, Government Printing Office, 1946), pp. 313-314.

products like valves, ball bearings, motors, crankshafts, and steel and aluminum alloys and shapes; i.e., components."*

The scheduling system involved identifying critical components, resolving conflicts, and ensuring that every program got a sufficient supply just in time for production. It was intended to eliminate competition for critical production capacity and to restrain advance ordering of components by controlling the flow of components to end users. Scheduling, by its nature, involves case-by-case breaking of bottlenecks, with allocations, financial assistance, and other measures applied as appropriate. As with other resource management methods, the need to schedule at least selected items for the military departments and other claimants (e.g., the Petroleum Administration, Maritime Commission, and Rubber Director), as well as for the civilian economy, dictated reliance on the central civilian coordinator.

In its 1944 annual report, the War Production Board stated:

Since the introduction of the scheduling techniques in February 1943, no major program in the military, foreign, or civilian fields has been unduly delayed because of a lack of materials or components. Production scheduling provided the industry divisions of the War Production Board, the claimant agencies, and industry itself with a flexible but uniform procedure for achieving the most advantageous distribution of critical products needed for the more important programs. It was a particularly valuable weapon in the latter part of 1944 for strengthening weak spots and supplying new demands created by the changing military situation.

*Ibid., p. 312.

However, detailed scheduling has been used sparingly, because of its complicated nature. During 1944 the products subject to scheduling control were continually reviewed to find out if they could be removed from such control, or else redefined so as to confine the scheduling to the most critical types and sizes.*

Requisitioning - Requisitioning is a final, drastic step, basically involving seizure of resources. Because this is such a drastic step, grants of requisitioning authority are generally constrained. Requisitioning can facilitate the utilization of idle equipment or move idle or scrap materials to war uses. In World War II, all requisitioning proposals, except those for food, had to be submitted to the WPB for review. As a final measure, requisitioning may be needed, but the authority is likely to be circumscribed carefully, as it was in World War II.

4.3 IMPLICATIONS FOR THE DEFENSE PRIORITIES AND ALLOCATIONS SYSTEMS

The current priorities system (with its familiar "DO" and DX" ratings) and the current materials allocation system (using "set-asides" and governing the use of aluminum, copper, carbon steel, and nickel alloys) have been around for over 30 years. Both systems were based on the "lessons" of economic management learned in World War II and the Korean War. Both the priorities and allocations systems need to be carefully considered in terms of a potential industrial mobilization. As discussed in the previous sections, such systems have been used for many purposes not covered by the peacetime system including:

*War Production Board, op. cit., p. 92.

- Setting priorities among defense production programs
- Allocating materials and setting priorities for essential civilian production*
- Controlling short-supply materials
- Scheduling production
- Determining the sequence of necessary industrial base expansions and conversions and the necessary priorities and allocations to support these activities.

Obviously, a peacetime system would be unnecessarily complicated by these considerations. However, by the time production demand exceeds the surge capacity of the peacetime defense industrial base, it may already be too late to begin considering such questions. (Significantly, however, all of these activities would be permitted within existing legal authorities; no new priorities and allocation authority is needed. See Appendix B for a discussion of these authorities.)

4.3.1 Priorities

As previously discussed, a priority system may be sufficient, by itself, to control problems if there is "almost enough" of something. Beyond this, allocation is required. In this new situation, the priority system indicates which programs are most important. These priorities guide the allocation system in "distributing shortages," i.e., determining which programs get what percentage of the total available product. Clearly, a simple two-tier system will be

*Note that support for allies may include some essential civilian production. However, allied support is viewed primarily as increasing the total demand for military items, a question of distribution after production is accomplished.

insufficient. Even when the relative priorities among defense programs have been worked out by the Organization of the Joint Chiefs of Staff, DoD, and the military services, the process has only begun. Priorities for civil defense, production expansion and conversion programs, and essential civilian requirements must also be considered.

4.3.2 Materials

The basic thesis of the materials control system that has been in force since the Korean War is that through control of the basic materials most widely used throughout the economy, the government can exercise basic control over the entire economy.* However, as noted in Section 4.2.2, the materials brought under the Controlled Materials Plan were, by coincidence, both most widely used throughout the economy and in shortest supply. A review of history shows that the controls over short-supply materials were needed regardless of whether the materials were also widely used in the economy.

This distinction is significant because it may no longer be true that the basic materials would also be those in shortest supply during a mobilization. Instead, some more exotic materials, such as cobalt, titanium, tantalum, and

*For example, Wallace Brown, Director of the Office of Industrial Mobilization, Department of Commerce, testified: "The DMS is an outgrowth of experience that was gained during the Second World War and during the Korean conflict when it was found that through control of those particular commodities, we could basically control U.S. industrial production. By controlling what firms receive steel, we could control what firms are receiving coke, plastics, rubber -- all the other elements that they might need -- transportation, energy, and so on." (U.S. Congress, Committee on Armed Services, "Capability of the U.S. Defense Industrial Base," (Washington, Government Printing Office, 1980), p. 1015.)

columbium may be the materials trouble-spots. A mobilization materials control system may have to cover these and similar materials to duplicate the effect of the World War II controlled materials plan.

Moreover, it is possible that these materials will pose a more formidable materials-control challenge than the basic materials did in World War II, for two different reasons. First, even in peacetime, the dominant use of many of these materials is to meet peacetime defense production requirements. Thus, there may not be a "reserve" of non-essential civilian usages that can be curtailed to help meet increased military requirements. Thus, increased production may be required to meet a much higher portion of the increased military requirements.

This situation is complicated by the second factor. While imports were a serious problem for some materials during World War II, the U.S. was actually self-sufficient, or at least could domestically provide a significant portion of requirements, for several of the short-supply materials. Thus, increasing supply was mainly an exploration and facilities expansion problem. This may not be the case with respect to many of the critical defense materials of future mobilizations. The U.S. is heavily import-dependent for many of these materials. In some cases (such as cobalt), there are low-grade domestic supplies which are uneconomical in peacetime but which could be used in wartime; in other cases, there are no known domestic sources. In any mobilization which involved interdiction of imported materials, this could greatly complicate the resource management problem.

The materials problem can only be solved through a combination of programs. In peacetime, attention should be

directed to identifying likely materials requirements as precisely as possible for varying degrees of end-item production expansion, and determining ways to satisfy these requirements. Increased attention should be given to stockpiling, especially those materials for which no other source (substitution, domestic capacity expansion) can be assured. Plans should also be developed to assure that filling existing stockpile deficits would have top priority during any pre-conflict warning period. (Stockpile goals have assumed a one-year warning period, during which industrial production is increased, but no plans exist to ensure that imports would be increased during this warning period.) Other actions which should be initiated in the preparatory phase, and which would doubtless continue in the early stages of the mobilization, include financial assistance to expand both mining and processing capacity and substitution and curtailment of civilian and low-priority military uses of these materials. Priorities and allocations, though needed, will not by themselves solve the materials problem. These demands will occur early in the mobilization when resource management will be going through its greatest stresses.

4.3.3 Scheduling and Sequencing

Scheduling production, i.e., controlling companies' order boards, is generally regarded as an extreme measure because it represents the removal of control by owners of their own assets. For the government, broad-based scheduling would be almost impossible because of the amount of data and the number of daily decisions required to be effective. However, limited scheduling may be required fairly early in a mobilization. In this limited sense, scheduling provides a way to best meet competing demands on a facility by several programs of virtually equal priority with "just-in-time" deliveries to

the next higher tiers. World War II experience indicates that government intervention in a production jam has two distinct advantages:

- The programs get back on schedule or develop an alternative schedule much more rapidly once the accusations stop flying. Actual needs for additional capacity can be separated from apparent ones, as well
- Company personnel can reassume control fairly quickly, implementing the new guidelines. These people have no power to dictate such guidelines on their own, and the crisis takes a high daily toll in morale and productivity, irrespective of the harm caused by inefficient use of available assets. Intervention minimizes that toll.

The overwhelming sense gathered from examining past industrial mobilizations, even minor ones, is that everything needs to be done immediately. This is a fairly common feeling in most project starts, but in this larger scale case, resources are a limiting factor. An order must be imposed rapidly to achieve the maximum gains. Thus, although the time needed to reorder the economy is relatively long (18 to 24 months to form a baseline for strong subsequent gains), a need exists to impose discipline on the process immediately.

The role of the resource manager is central to this requirement. Ultimately, the resource manager must sort through the various claims to identify how the shortages will be allocated. Decisions must be made about which programs will get which percentages of their claims in a given time period when the overall supply cannot meet all claims. Choices must be made between and among:

- Strategic production programs
- Tactical production programs
- Expansion of production capability (including the expansion-nature portions of conversion programs--see Section 5.3)
- Hardening of facilities to protect industrial sites and the civilian population.

To properly allocate resources a sequence must be developed indicating when certain actions must be accomplished. This enables effective tradeoffs to be made among seemingly disparate programs (e.g., between tanks, anti-aircraft missiles, new aluminum processing capacity, and civil defense shelters). These decisions will hinge on the current and anticipated events. Among the more difficult trade-offs, as in the past, will be the decision whether to maximize current production or to limit current production in order to invest resources in future expansion. A considerably more elaborate priorities system than that currently in use will be needed.

5.

EXPANDING DEFENSE PRODUCTION

The scale of mobilization is largely determined by strategic necessity and resource availability, rather than by the capacity of peacetime defense producers. In past industrial mobilizations, the capabilities of peacetime producers have been a secondary factor in determining the ultimate scale of the military buildup. In all likelihood, military requirements during a national emergency would exceed by large measure the capabilities of the defense industrial base to manufacture the needed weapons and equipment, even though the modern base is much larger than those of the past. In a national emergency, the government is not bound by these capacity constraints, but will create new productive resources for the manufacture of defense items.

5.1 THE PEACETIME DEFENSE INDUSTRY

Even though the peacetime defense production establishment is much larger than it was before prior mobilizations, significant expansion of production capacity would be needed for any substantial production increases. This is true because peacetime defense producers typically maintain little excess capacity.

Current defense producers generally size their facilities and workforce to meet the current orders. Because defense production is increasingly specialized and segregated (even within diversified companies) there is little built-in

expansion capability.* Compared to the nation's ultimate military requirements in wartime, the existing facilities of peacetime defense producers are sized to contribute only a small portion of the total output required.

For many sophisticated components and subassemblies, current military requirements take essentially all available capacity. Even in the case of prime contractors, whose facilities are nominally planned to produce current needs on a one-shift basis, there is not the built-in capacity for a tripling of output that would be suggested. First, most prime contractors are assemblers and system integrators, and are dependent on a flow of parts for any production expansion. Moreover, many contractors are facilitized on a "modified one-shift" basis. While basic production facilities are used only 40 hours a week (and able to expand):

... In several cases where individual machines are utilized close to capacity, spot bottlenecks would prevent full utilization of idle capacity. Test equipment would be an early bottleneck item in several...industries (e.g., tactical missiles and semiconductors), since this equipment is commonly utilized at close to capacity. Expensive production equipment, such as precision grinders in the aerospace bearing industry and 5-axis machines in the helicopter industry, would also reach full utilization at an early stage, because utilization rates for such equipment are kept high to amortize their cost over a greater amount of product.†

*For a more detailed discussion of current industry capabilities, see Winslow, Paul R., et al., Cost-Effective Options to Enhance U.S. Industrial Mobilization Potential (Washington, D.C., The Analytic Sciences Corporation, TR-5037, 1984).

†Ibid., p. 2-9.

The availability of a trained workforce would also limit the ability of current producers to expand output immediately, although increasing the work week could provide some increase.

For these reasons, the current defense industry cannot meet mobilization requirements without augmentation. Industrial mobilization planners must create new productive resources during a national emergency, as they have in the past.

Before the U.S. entry into World War I in 1917, the United States maintained only a fledgling defense industry. Although small arms manufacturers had substantial capacity, thanks largely to Allied orders, U.S. industry produced few platforms or sophisticated weapons systems. Annual aircraft production, which was 400 units in 1916, climbed to more than 14,000 aircraft in 1918.^{*} The construction of merchant vessels and combatant ships rose dramatically, exceeding all expectations. On July 4, 1918, U.S. shipyards delivered more sea-going vessels than had ever been launched from American shores in an entire year.[†] During General Pershing's 1916 Mexican expedition, the U.S. Army still relied on horse-drawn wagons to transport troops and suppliers. Before the armistice in 1918, U.S. automobile manufacturers produced 10,000 military vehicles.[§] Smokeless powder production increased from 50,000 pounds per day in 1914 to 1,250,000 pounds per day in 1917.[¶] Other illustrations of the government's ability to create new resources from virtually a non-existent peacetime

^{*}Holley, op. cit., p. 189.

[†]Stockbridge, Frank Parker, Yankee Ingenuity in the War (New York, Harper and Brothers, 1920), p. 158.

[§]Huston, op. cit., pp. 324-325.

[¶]The Army Industrial College, "Industrial Mobilization", Report 1940, p.59.

base occurred in World War II. For example, before partial industrial mobilization was declared in 1940, the United States had existing facilities to make only 200 rifles a day and virtually no specific plant capacity was available for producing major items, such as tanks, guns, and completed ammunition.*

The U.S. defense industry deteriorated massively after the hasty U.S. de-mobilization in 1945. Production rates for major weapon systems and platforms fell close to pre-war levels. When the North Koreans invaded South Korea in June 1950, the production of military aircraft stood at approximately 2,500 planes per year. In December, President Truman announced a national emergency, and set production goals for defense production. Industry was ordered to acquire the capability to manufacture 50,000 aircraft by 1953 in the event that war broke out with the Soviet Union.[†] The target for annual tank production was set at 35,000 units, though not a single new tank had rolled off a U.S. assembly line in 1950.[§] Before the U.S. decision to intervene in Korea, no factories were actively manufacturing metal parts for artillery shells and other types of ammunition.[¶]

Even during the Vietnam era, the much larger peacetime defense production base was unable to satisfy initial military demands, despite the limited nature of the conflict. The government had liquidated its conventional gravity bomb

*Smith, R.E., op. cit., p. 438.

†Vawter, op. cit., p. 22.

§Ibid.

¶Ennis, Harry F., Peacetime Industrial Preparedness for Wartime Ammunition Production (Washington, National Defense University, 1980), p. 38.

manufacturing equipment in the early 1960s. The U.S. Air Force rapidly depleted war reserves of 500 pound iron bombs and had to wait 18 months before receiving the first such bomb from new production. The government also did not have sufficient active government-owned ammunition factories to assure sufficient supplies of bullets and artillery shells. Those plants available were outmoded, sadly neglected, and many were 25 years old in 1965, when the buildup began.*

The amount of resources needed to allow industry to expand its production to deter or meet a perceived threat has a direct impact on where these resources might be obtained. Relatively small demands might be met entirely from existing defense production capacity, including current production and unused capacity (e.g., through second or third shifts or increasing the output of operating lines that are producing below their full capacity). A perception of relatively high demands, but with a long expected period in which they could be met, might be dealt with primarily through the building of new capacity. Overall, these sources are presented here in hierarchical order. The further down into this list the nation must go, the more economically disruptive the industrial buildup would be. The basic sources of additional output are:

- To utilize existing defense capacity by applying output to the scenario at hand, operating existing lines more fully, and activating standby lines
- To use alternate sources including available resources not now being used but which could provide additional

*Ibid., p. 41.

output with a minimum of disruption to other production

- To build new capacity through the construction, training, and resource controls that expand defense production capability
- To convert civil capacity by converting civil plants to the production of military hardware
- To divert civil capacity by allowing the economic process of attrition to shift resources to higher priorities. Additionally, decisions could be made to take machines, personnel, floor space, etc., away from their current civil use and apply those resources to defense production. Here, the whole plant or company would not convert to defense production, only parts of its assets would do so. This practice would be particularly disruptive especially in the short-term.

Within the overall economy, resources are available that are not now part of the producing economy. These resources can be tapped to assist the buildup without causing major disruptions of the current economic base. These resources, like existing defense capacity, may smooth the course of the initial period of mobilization and will provide the basis for expansion and conversion.

For additional inputs to the work force, several sources are available. The unemployed and students can be put to work in industry. Training and educational programs can be revamped to assist these individuals in meeting the skill needs of defense production. (Housewives were a large source of additional workers during World War II. Because so many families now have two income earners, this source may provide proportionately less input today.) Additionally, many recently

retired workers should be willing to return to the work force if they perceive the need to be great enough. Attrition could also be reduced if potential retirees remain on the job. Further, foreign national workers could be brought into the economy.

Another source of resources for mobilization is the government stocks of items specifically set aside for crisis situations. The National Defense Stockpile of raw materials and the Strategic Petroleum Reserve could provide for some increment of increased demand for these goods. The General Reserve of machine tools could provide some additional machines.

Additionally, continuing imports would provide some level of input. However, while imports of raw materials, components, and finished goods are a source of inputs, they are also an area of potential problems. Because the modern national economy has become import dependent, effort must be expended to continue these imports at least until replacement means can be created.

The following sections discuss the government's historical efforts to create capacity through the construction of new facilities and the widespread conversion of civilian capacity to defense production. Ultimately, mobilization is constrained by the availability of capital and raw materials, and the quality, size, and technological sophistication of the working age population. However, nations rarely approach these theoretical limits to industrial output.

A survey of past mobilizations indicates that strategic requirements are the most important factors in determining the ultimate scale of industrial output during

mobilization. Scarcities of skilled labor, raw materials, and industrial capacity limit mobilization potential in the short run. Over time, however, the government can create these factors of production. To accomplish this, effective resource management programs and planning are needed.

5.1.1 Weapons Technology

Military weaponry has been on the "leading edge of technology" throughout the twentieth century. This qualitative push for the newest and best available equipment originates, in part, from actual combat experiences. Time and again in this century, inferior aircraft and less well-equipped forces have been defeated or pushed aside in conventional combat by numerically inferior but qualitatively superior forces. However, peacetime production of military equipment of this type has presented several problems for mobilization including:

- Very low peacetime production rates and a corresponding "carriage trade" production process
- Use of production techniques with much higher tolerances than are part of civilian-oriented mass production
- Modern reliance on exotic materials often used almost exclusively for military and aerospace production (with associated very low material output rates and foreign source dependencies).

These problems have important implications for the modern industrial mobilization planner.

5.1.2 Converting to Mass Production

Twice in this century the U.S. economy has responded to American entry into worldwide war by converting the weapons of war to mass production processes. In World War I, automobile manufacturers switched from production of 60 horsepower engines to producing a 12 cylinder engine of 440 horsepower. In World War II, again with the aid of the automobile manufacturers, the nation increased aircraft production from a few hundred relatively simple aircraft per year to the production of nearly 100,000 much more complex aircraft in a few years time. Relative to the economy of 1939, the production of military aircraft were affected by all of the problems that affect modern aircraft production, as discussed previously. Given sufficient time (time that may not be available), the economy can undoubtedly accomplish the same "miracles" with modern weaponry. However, the mobilization planner must consider how this would be done.

Shifting to military production in the modern era may not be quite the same as these past examples. Modern aircraft are powered by jets, not piston engines. The automobile industry may not be the pool of resources for this type of production as it was with piston-powered aircraft. Modern aircraft are also enormous in comparison with past counterparts, a problem that manifests itself in the demand for outsize castings and the use of heavy forging presses. Large increases in production with those processes could not be accommodated by current facilities, and could not immediately be shifted to facilities currently producing civilian products. This not only has strong implications for expansion and conversion, but reemphasizes the importance of time. Mass production of modern aircraft, submarines, ships, etc., presents problems that may be unique in our history.

This suggests several considerations for the planner. First, the problems of mass production should be considered in mobilization planning. Potential mass producers should be consulted in that process, perhaps through revival of the plant surveys, production studies, and educational orders programs. Second, alternative designs should be developed in peacetime that provide similar combat capability without relying on the more esoteric processes and materials used in current production. Third, consideration needs to be made of the mission performance tradeoffs involved in producing different, more mobilizable systems than those that are part of the peacetime force structure (e.g., production of antitank missiles instead of tanks or antiaircraft missile systems instead of air superiority fighters).

All of these remedies are generally regarded as being within the purview of the Department of Defense. It is certainly true that the military must have as much control as possible over relative production priorities. However, the next war will have to be fought with the weapons that can be made available until economic remedies can be applied. As it will ultimately fall to the civil sector of the economy to provide for production increases beyond a minor surge, these three considerations need to be made a part of government-wide mobilization planning regardless of the implementing agency.

5.1.3 Materials Considerations

Production of modern weapon systems also requires the use of exotic materials, especially light metals such as cobalt, titanium, and aluminum. Much of the current worldwide output of these materials (and of various rare earths) is consumed in the production of defense and aerospace equipment. Increasing the output of these systems will require finding

new sources of the materials, and stringent controls over their use. (Section 4.3 discusses the need for controls in more depth.) The materials currently subject to controls include only one of these items, aluminum.

The current materials control system was founded, in large part, on the basic economic situation of the middle part of this century. Copper, steel, and aluminum had the foundation position in that economy. Controlling those materials allowed control of the entire durable goods portion of the national economy. Not coincidentally, military output was also based on those materials. Thus, allocation of these materials served the dual role of maximizing military output while controlling the economy. However, the modern economy has changed; durable goods production is no longer the dominant economic division. Within the durable goods sector, military production also has changed. The implications of these changes are fairly clear. On the one hand, we will need different methods to control the economy. On the other, we will need to think, in peacetime, about alternative sources and processing methods for the materials used in defense production.

5.2 EXPANSION OF CAPACITY

While conversion has played an important role in narrowing the gap between peacetime capabilities and mobilization requirements, the government, in major mobilizations, has always found it necessary to build new productive capacity, especially for basic materials and completed systems.

Developing new capacity can be one of the least economically disruptive methods of achieving a needed defense

industrial buildup.* Factory construction is not the only consideration. The "long poles in the tent" are acquiring trained labor, building machine tools, and developing a pipeline of components to the plant.

One overriding requirement of any large buildup will be the manufacture of new machine tools. (Difficulties in determining machine tool requirements are discussed in Section 3.1.3.) A very important lead time that planners must consider is the time it will take machine tool builders to manufacture the additional machines needed to significantly increase their own output capacity.[†] This increased capacity, needed to support a large buildup, will then be used to produce the machines that produce defense components and end-items. Additional skilled workers will also be needed to operate the machines. While modifications to the normal training process can be introduced, the workers must be hired and given some minimum training.

Expanded mining and drilling activity is an alternative source of supply for raw materials and petroleum that are not available in adequate quantities. New methods to process ores may also be needed when the chemical composition of the

*One potential disruption that can result from relying on expansion is "priorities unemployment," the phenomenon seen in World War II where civilian production was curtailed to free up resources for expanded defense production. Many manufacturers saw their commercial production curtailed, not to expedite conversion, but merely to free up materials for other producers. This stimulated pressure for small business contracting incentives which continues to this day.

[†]In the initial stages of the Korean War period, the machine tool industry had to be given first call on its own output. When a specific tool was needed by a machine tool builder, the National Production Authority diverted that tool from its intended customer. (Joint Committee, op. cit., p. 42.)

U.S. clay bearing alumina ores versus currently used bauxites, and tar sands or shale oil as opposed to crude oil. When the availability of the resource becomes more important than the cost (as in a mobilization or war), such solutions are technologically feasible. Another source of such materials is recycling, which could be introduced on a more vigorous scale.

Two areas that can greatly increase productivity, and thus output, are considerably more difficult to measure. One of these is to more fully utilize people in their existing jobs. Many people would respond positively to a perceived national need with increased productivity. The other area is technological innovation, including greater automation and the redesigning of military equipment to make it more readily producible. Although this might involve "cutting corners" which would result in weapons having inherently shorter life-spans, items do not have to last 20 years, as in peacetime, if they are expected to be consumed in a war.

The following examples vividly demonstrate that, in extraordinary circumstances, the government can create new resources to dwarf the nation's pre-war capabilities to manufacture military items.

In World War I, the government built or financed 16 of the 92 plants ultimately used in the manufacture of powder and high explosives, 5 of 18 gun-producing facilities, 4 nitrate plants, and 8 plants for the manufacture of toxic gas, gas masks, and gas shells.* But it was in shipbuilding that the greatest achievements were made to expand productive capacity. Before the U.S. declaration of war, there were only 61 shipyards in the United States. By war's end, 341 yards

*Huston, op. cit., p. 319-320.

were in operation, delivering more than 400,000 deadweight tons a month.*

In World War II, the United States managed to double the size of its economy, primarily by building new productive capabilities. Special emphasis was placed on increasing the extraction of raw materials to feed the growing war economy. Increased mining and processing capacity permitted aluminum production to rise 600 percent from 1939 to 1943. In 1944, magnesium production reached 50 times the pre-mobilization rate.[†] New mines were opened throughout the west to satisfy the material requirements of defense procurement.

During the first stages of U.S. participation in World War II, the Japanese cut off the nation's supply of natural rubber from Southeast Asia. The response to this, the synthetic rubber program proved to be a dramatic example of the government's ability to create new resources in a national emergency. A joint government-industry research effort led to the development of a petroleum-based material with properties comparable -- and in some ways superior -- to those of natural rubber. The government spent \$700 million to build synthetic rubber plants.[§] By 1945, the nation had created an industry capable of producing more than 800,000 tons of synthetic rubber annually versus a capability of 2500 tons a year in January 1942.^π

*Stockbridge, op. cit., p. 156.

[†]WPB 1944 Report, op. cit., pp. 31-33.

[§]Novick, op. cit., p. 226.

^πNelson, op. cit., pp. 290-306.

While the dramatic increase obtained in the production of military aircraft during World War II was due in part to the conversion of the civilian automobile industry to the production of aircraft engines and components, many new facilities were built during the war to accommodate final assembly of military aircraft. Existing automobile facilities did not have sufficient floor space for such operations. In 1941, for example, Ford built the Willow Run facility, the largest aircraft plant in the world. Willow Run included 1,600 machine tools, 7,500 jigs and fixtures, and an overhead conveyor system that made possible the mass production of B-24 bombers on a scale never before thought possible.*

These examples only suggest the scale of expansion undertaken by the government in World War II. As Table 5.2-1 indicates, aircraft production increased 28 times. The production of explosives and ammunition rose by a factor of 38 between 1939 and 1943. Eighteen times more sea-going vessels by deadweight tons were delivered in 1943 than in 1939.

Because the Korean conflict was viewed as the precursor to a wider war, the objective of the Korean-era mobilization was to create the industrial infrastructure for a much larger war effort. The need to expand capacity was heightened by the fact that many industries were operating at or near capacity at the onset of the crisis. While end item procurement rates increased, emphasis was placed on stockpiling machine tools and strategic materials and building up the industrial base to support industrial mobilization. Government objectives were almost as ambitious as the mobilization effort of World War II.

*Ibid., p. 220.

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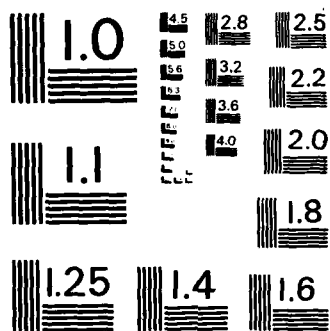
RESOURCE MANAGEMENT: AN HISTORICAL PERSPECTIVE(U)
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

TABLE 5.2-1
FEDERAL RESERVE INDEXES OF OUTPUT OF CERTAIN
MANUFACTURING INDUSTRIES IN THE UNITED STATES

	1939	1940	1941	1942	1943	1944
Aircraft	100	245	630	1706	2842	2805
Explosives and ammunition	100	140	423	2167	3803	2033
Shipbuilding	100	159	375	1091	1875	1710
Locomotives	100	155	359	641	770	828
Aluminum	100	126	189	318	561	474
Industrial chemicals	100	127	175	238	306	337
Rubber products	100	109	144	152	202	206
Steel	100	131	171	190	202	197
Manufactured food products	100	105	118	124	134	141
Woolen textiles	100	98	148	144	143	138
Furniture	100	110	136	133	139	135
Clothing	100	97	112	104	100	95

SOURCE: Compiled from United States W.P.B., Program and Statistics Bureau, General Economic and Planning Staff, "The Effect of the War on the Industrial Economy," Document No. 27, Washington, D.C., 1945, as cited in Milward, op. cit., p. 69.

As in earlier mobilizations, the government sought during the Korean War period to increase the nation's capabilities to produce raw materials. The government provided multi-million dollar loans for copper mine development and subsidized exploratory mining for several strategic minerals, including uranium, tungsten, beryllium, copper, and manganese. The government also became the buyer of last resort, and stockpiled much of the output produced by the new mines. The production of these materials rose dramatically throughout the mobilization period.*

The government also encouraged the expansion of the industrial base which, in the event of war with the Soviet Union, would support the rapid increase of defense production. The 1000-mile Platte natural gas pipeline was constructed under the accelerated tax depreciation rates. The government also directly financed facilities for industry, one of the most direct forms of expanding capacity for military production. Government-built facilities included heavy forging presses, designed for the manufacture of aircraft and weapon parts. Many basic metals industries, including steel, copper, and aluminum, were also expanded.†

5.2.1 Government Financing of Expansion

Without some government encouragement, industry will not expand capacity to produce military items. This is especially true prior to combat, when there is no certainty that the capacity will be needed. Even awarding production contracts will not guarantee expansion, since new facilities

*Vawter, op. cit., pp. 26-27.

†Ibid., pp. 21-27.

cannot be amortized in that brief period. Early in the pre-World War II rearmament, the Defense Plants Corporation, a subsidiary of the Reconstruction Finance Corporation, financed facilities expansion. Several other methods were also used. These methods were refined and adapted during the Korean War, and one principal authority used for financing expansion remains in force.

Past expansion programs have been paid for by non-defense agencies, since military funding would require competing for resources with ongoing production. To encourage economic expansion during the Korean War period, the government used the authorities of the Defense Production Act (DPA) or tax statutes. These programs sought to minimize direct Federal outlays while encouraging mobilization-oriented expansion. These programs included:

- Accelerated tax amortization
- Guaranteed purchases
- Direct loans and loan guarantees
- Provision of government-purchased tools to privately-owned plants
- Construction of government-owned facilities
- Grants for exploration, research, and development.

Modern planners should be aware of all these methods, although the authority currently does not exist to initiate all of these actions. By far the largest program was for tax amortization. (No parallel amortization authority exists at present.) Over \$23.1 billion in rapid amortization was approved under this program which allowed manufacturers to write off new facilities more rapidly. Over \$2.1 billion in

loans were guaranteed and another \$300 million in direct loans were provided. These various programs involved some inefficiencies, but were very effective in promoting expansion.*

5.2.2 Management of the Construction Industry to Support Expansion

A strategy of expansion places enormous demands on the construction industry. The construction industry, essential for expansion, proved especially difficult in World War II. The massive requirements were unforeseen and the industry was badly managed by the government. Even well-prepared approaches would have faced great difficulty. The character of the construction industry is essentially local, making central management much more difficult. Additionally, no statistical reporting system was available on the industry prior to the war. Further, the demand on the industry grew rapidly and ran the gamut from industrial and utility facilities to military bases and housing for workers. All of this was complicated by the fact that some of the materials needed for construction were the same as those needed for military production, e.g., steel.[†]

When military requirements increased dramatically, the problem became almost unmanageable. Estimates of the 1942 military and industrial construction program ranged up to \$20 billion, far beyond the limits of feasibility, except at the cost of curtailment of war production. This situation was the culmination of "planlessness and maladministration."[§]

*Ibid., pp. 22-26.

[†]Novick, et al., op cit., p. 287.

[§]Critics noted that plant expansions for high octane gasoline, TNT, and synthetic rubber had been given simultaneous starts without identifying the inability of the compressor industry to provide sufficient equipment for all three undertakings. (Ibid., pp. 287-302.)

A similar review in 1943 of current and projected construction indicated that it was claiming so large a share of materials, components, and labor that it threatened the satisfaction of current military, export, and essential civilian production demands. The most urgent construction projects, such as those for high octane gasoline, synthetic rubber, and basic steel-making facilities, were being delayed. Attempts were made to stop all non-essential construction, military as well as civilian, but were unsuccessful.*

The WPB never was able to resolve the problem. In the end, much unnecessary construction was undertaken. For example, the Army ended up building ammunition plants that were operated only part time. The scale of the problem is best illustrated by the fact that construction from 1940 to 1942 totalled \$38 billion then-year dollars (\$229 billion in 1982 dollars) while the total output in military goods for the same period totalled \$43 billion (\$259.2 billion in 1982 dollars). The problems of labor, machine tool production, and scheduling prevented the full utilization of many of these plants throughout the war.

5.3 CONVERSION OF CIVILIAN INDUSTRY

Conversion is the other major method the government will use to create new productive resources for defense purposes. Theoretically, conversion is the practice of applying civilian resources to the war economy. In contrast, expansion involves constructing new productive facilities, finding new sources of labor and, in general, creating those factors of production needed to increase the output of the economy. While

*Ibid., pp. 295-298.

conversion offers the advantages of an existing supplier network, manpower pool, and management structure, expansion holds the promise of creating a larger economic base from which to manufacture military goods.

In some cases, conversion requires little change in existing facilities or production processes; converting civilian truck manufacturing capacity may involve no more than changing the color of the paint. More often, however, conversion of existing civilian capacity involves extensive re-tooling to accommodate military production or the addition of new plant and equipment to obtain a required production process. Often, there is little clear distinction between conversion of existing facilities and construction of new factories. As the president of General Motors noted during the first years of World War II:

When you convert one of our factories, you move everything out and start with blank space. Out of a long row of intricate machines on the production line a certain percentage may be used in the manufacture of a war product, depending on what that war product is. But the production line will necessarily consist mainly of new, special-purpose machines along with any of the old machines that can be rebuilt for the new manufacturing process.*

(New flexible machining centers and programable tools may allow modern manufacturers to convert more rapidly, as substitute tools on a large scale may not be needed. However, this positive situation regarding machine tools may, in effect, simply change the bottleneck from tools to tool programmers, the skilled individuals who must reprogram the tools.)

*Nelson, op. cit., p. 218.

Some noteworthy "conversions," like the construction of the Chrysler tank factory in 1942, were "conversions" only in that the government utilized existing management expertise in the civilian economy to manage newly-built facilities. Other conversions may be accomplished by introducing additional machine tools into the facility, without new construction. Almost any "conversion" of existing civilian facilities to war production involves elements of expansion.

One critical distinction between conversion and expansion is that conversion provides more balanced utilization of the economy, especially if civilian production is curtailed. Expansion, on the other hand, usually will be preferred by businessmen, especially if there is any chance that they will be permitted to maintain existing commercial production in their existing facilities.

In World War II, initial contracts were concentrated with very few manufacturers. By the end of 1940, it was evident that conversion of plants in existing manufacturing centers might be necessary:

By that time large manufacturers who had obtained defense contracts would be using their industrial capacity close to a maximum. If they expanded their plants, additional raw materials would be consumed and social problems aggravated. Areas in which defense industries tended to concentrate because of the existence of large plants would experience a tremendous population expansion, and production bottlenecks would be created because of labor shortages, housing problems, and transportation difficulties. The consequences would be damaging both to the defense program itself and to the economic and social life of the nation as a whole.*

*Connery, op. cit., pp. 115-116.

Conversion offers the advantage of applying productive assets in the civilian economy to the production of military items. As noted, even the most successful "conversions" often involve the introduction of large amounts of new machines and equipment. However, machine tools and capital equipment are only one factor of production. In addition to providing factory floor space, civilian manufacturing firms can make available for defense production existing pools of skilled labor, engineering talent, management skills, established supplier networks, and access to convenient transportation. In past mobilizations, the government has sought to harness these productive resources for the war economy.

Conversion played an important role in the development of the Liberty engine, one of the outstanding U.S. industrial achievements of World War I, the first mass-produced aircraft engine. After the decision to develop and produce a standard aviation engine in May 1917, engineers from Packard Motor Car Company and Hall-Scott Motor Car Company developed pre-production models of a 12-cylinder aviation motor. Because the auto companies had only manufactured 60-horsepower automobile engines, they had to undergo extensive modification to accommodate the production of the much larger 440 horsepower aircraft engine.* Packard, Hall-Scott, Lincoln, Ford, General Motors and other automobile manufacturers produced 13,500 Liberty engines before the armistice, thousands of which were used in British and French aircraft.†

*Stockbridge, op. cit., p. 28.

†Huston, op. cit., p. 327. One caveat is in order, however. Conversion of industry may have been considerably less of a challenge in the past, at least for selected items. For example, aircraft engines prior to the jet era were much more similar to auto engines than they are at present, and conversion may be more difficult. Along with re-tooling, educational orders and voluntary agreements might be needed. (See Section 5.5 for a discussion of these methods.)

Perhaps history's most startling example of the successful conversion of civilian industrial capacity to fulfill military requirements was the integration of the nation's automobile companies in the production of military aircraft during World War II. Determining which factories would produce what components proved to be a relatively straightforward affair. Donald Nelson, eventual chairman of the War Production Board, recalled how William E. Knudsen, the director of the Office of Production Management, brought together the major automobile manufacturers to identify opportunities for conversion:

Knudsen had brought to the meeting bits and parts of airframes and, I believe, some engine parts. Major Jimmy Doolittle...asked the manufacturers what they could do about reproducing the specimens which were on exhibit. They were asked to study them and deliver a verdict. They handled, measured, and inspected the specimens, and decided that probably they could do much about reproducing them in their own plants.*

The automobile industry made an especially important contribution to the medium bomber program. Chrysler and Hudson supplied Glen L. Martin with B-26 parts; North American used subassemblies built by Fisher Body Division of General Motors; and Ford Motor Company supplied major components -- such as fuselage, wings, tail, and landing gear -- to Douglas Aircraft Corporation.[†] Following the U.S. entry into the war, the automobile companies manufactured 75 percent of all aircraft engines, more than one third of all machine guns,

*Nelson, op. cit., 219.

[†]Holley, op. cit., pp. 304-310.

and one half of the Diesel engines.* The automobile industry also delivered 2,400,000 military vehicles.[†]

The World War II mobilization effort is replete with other important if less dramatic examples of successful conversion of civilian capacity. Private firms that produced civilian goods like hardware and juke boxes delivered by war's end almost 6,100,000 carbines to the military.[§] Facilities that during peacetime had produced refrigerators, washing machines, and other goods prohibited during the war were modified to manufacture a variety of military items.

Conversion played a less prominent role in the Korean-era mobilization. Mobilization efforts focused not on converting civilian industry per se, but taking prudent steps to facilitate conversion in the event that war should break out with the Soviet Union. Successful conversions even occurred during the Vietnam conflict. Mattel, a toy manufacturer, adapted its facilities for the manufacture of stocks for the M-16 rifle. Two of three M-16 rifle producers -- Harrington and Richardson and General Motors -- were not regular, peacetime military rifle manufacturers.

5.4 CONVERSION OR EXPANSION STRATEGIES

Neither conversion nor expansion of capacity will happen without government action to force the issue and to

*Nelson, op. cit., p. 217.

†Huston, op. cit., p. 480.

§Ibid, p. 475.

orchestrate these activities. Experience prior to World War II shows especially clearly a trend which would be likely to recur in any future crisis. Initially, businessmen were extremely reluctant to engage in rearmament programs. This was true for a variety of reasons:

- Uncertain of the duration of the emergency, they were extremely reluctant to invest in a "war boom" which might not materialize
- Many businessmen were extremely concerned about the disruption of established commercial and trade patterns which could be caused by either a war or a pre-conflict conversion program
- Generally conservative business voices expressed deep concern about the likelihood that mobilization would lead to further centralized economic controls
- Many business voices feared the inflationary effects of a "war boom," (particularly the increased labor costs that war prosperity could cause by tightening the labor market).*

An additional factor undoubtedly cooled business enthusiasm for defense programs. Having recently weathered the Nye Committee "Merchants of Death" investigation, which essentially attributed American involvement in World War I to a "plot" of businessmen, many businessmen were understandably reluctant to expose themselves to similar charges.

*A useful discussion of this reluctance is found in Stromberg, Roland N., "American Business and the Approach of War, 1935-1941," Journal of Economic History, issue no. 1, 1953, pp. 58-78.

Rearmament clearly posed serious economic risks to business. For existing defense producers, it might mean establishment of new competitors. For non-producers, such as the automobile industry, it could mean diversion from their normal lines of business, which, at the least, would delay accomplishment of their commercial goals, and might result in permanent loss of these markets to domestic or foreign competitors who were not similarly constrained.

The short-term nature and uncertainty of war profits added a further element of risk. Even the offer of a war contract provided little incentive if it required either disruption of existing commercial orders or investment in new facilities. If the former, it meant a diversion and possible loss of markets, while the latter could result in an unprofitable, unneeded facility once the war work were completed.

Even accelerated depreciation provided a limited incentive. Business still faced the risk that they would be left with an unprofitable facility and potentially-disastrous over-capacity at the end of the war.

In the prewar period, the Office of Production Management, civilian coordinator of rearmament, reflected the generally conservative approach of businessmen, and favored a "go-slow" approach. It was logical that OPM, headed by a former General Motors president and largely staffed by "dollar-a-year men" recruited from industry (and still on industry's payroll) would reflect this viewpoint. Arrayed against OPM, although themselves not in total agreement, were the military (advocating a "we need everything yesterday" approach), certain key mobilization officials who favored more vigorous measures (notably Donald Nelson and Senator Truman), and numerous New Deal liberals who were inflamed with the crusade against

totalitarianism. One of the great ironies of the prewar period was summarized by one historian:

Continuing rivalry between the OPM and the Office of Price Administration and Civilian Supply (OPACS) made the situation still more confused. OPM had recruited its personnel from business and industry, while the Office of Price Administration under Leon Henderson was staffed by career civil servants and people from universities and research institutions. Henderson's office was charged with protection of the civilian economy but no one would have guessed it from their actions. Its personnel paradoxically fought sturdily to reduce civilian production and convert it to war production. Indeed they accused the industrialists in OPM of underestimating defense needs and refusing to expand war industries.* (emphasis added)

Of course, Pearl Harbor dissipated much of the business reluctance to engage in war production, and the massive curtailment of civilian production eliminated what little resistance might have remained. This fact, however, emphasizes the importance of government plans and government actions to orchestrate conversion and expansion. Prior to the dissipation of this resistance, government persuasion or direct action was needed to promote prewar preparations; even after Pearl Harbor, a studied program of conversion policies was necessary to expand production and to eliminate confusion and social dislocation.

Establishing conversion or expansion plans is one of the most important peacetime planning functions. It was clearly seen in World War II that the absence of these plans delayed and disrupted initial war preparations. The planner

*Connery, op. cit., p. 104.

must consider which of these strategies to pursue, or, if both are pursued, in what combination. The following sections discuss some considerations that could influence development of peacetime conversion or expansion plans.

5.4.1 Advantages of Expansion

For a number of reasons, expansion may be easier to pursue prior to the outbreak of conflict. Especially if basic resources are in plentiful supply, it is easier to expand production capacity than to terminate civilian production to make way for defense production.

For this reason, business has always preferred expansion as a strategy for increasing the output of military end items. Expansion increases total resources available, can avoid disruption of non-military production, and also benefits from reliance on already-trained and qualified production sources.

For many of these reasons, the U.S. has tended to favor expansion in past mobilizations, especially during preparatory phases. As noted earlier, the Korean War saw extensive expansion of productive capacity, as the Administration was extremely reluctant for political reasons to curtail civilian production. Prior to Pearl Harbor, in the rearmament phase, most new capability was obtained through construction of new factories; even when civilian production was curtailed, it was more often done to make materials available for production rather than to expedite conversion of new producers.

5.4.2 Problems with Expansion

Expansion can also cause significant inefficiencies and dislocations. Ultimately, while expansion creates additional production resources, in most cases it will require more investment of resources than conversion would to provide this increased capacity. This could be especially critical in the early stages of all-out mobilization, because the sectors most likely to be strained would be the construction and machine tool industries.

Expansion can be a much more expensive way to obtain new capacity. This is especially true because the government will be expected to pay, directly or indirectly, for virtually all expansion. In the past, the government paid for virtually all expansion, through one or more of three methods:

- Actual construction of the facilities, which were then generally leased to private operators
- Tax provisions which permitted rapid amortization of new defense production facilities
- Loans, loan guarantees, and/or purchase agreements to reduce construction costs, make capital available, or provide an assured market for the new plant's output.

Because of present legal requirements, none of these options is as attractive as it was in past mobilizations.

Direct government funding - Several provisions of law make it more difficult to pursue a strategy of government construction. Perhaps most significant, the Defense Industrial Reserves Act (50 U.S.C. 451 et seq.) presently establishes national policy as favoring reliance "to the maximum extent

practicable" on private industry to support defense production. While this law does not preclude government ownership of production facilities, it has been interpreted as establishing a strong preference for private ownership. Indeed, because of this law, the government has recently disposed of a number of production facilities, including aircraft production plants and heavy forging presses. While this law could certainly be amended, it would require a reversal of a view which is strongly held on Capitol Hill, where even federal loans and loan guarantees to encourage new plant construction are looked on with disfavor.

The government's experience in past production facility disposals could reduce the likelihood of changing this preference. Both in the period immediately after World War II and in the disposal of facilities following passage of the DIRA, the government generally sold the facilities to the current operators at a small fraction of their cost. This led to charges of "sweetheart deals," and competitors of the facility operators complained that the government was giving the existing operators an unfair competitive advantage. It is quite likely that a similar form of opposition would make it difficult to approve a government construction program, or at least would result in adding substantial procedural requirements to such a program.

An additional problem for government-funded facilities expansion programs is posed by the National Environmental Policy Act, which requires that an environmental impact statement be prepared for all "major federal actions." Government plant construction would undoubtedly be considered such an action, and, unless NEPA were modified, the requirement to prepare such statements, and the possibility of litigation, could substantially delay industry expansion.

Neither of these requirements is a fatal barrier to government funding of new plant construction. However, both of them could significantly complicate such efforts. At a minimum, the need to provide a source of funding and to cope with these two problems, both of which reflect deeply-held philosophical viewpoints on Capitol Hill, reduce the viability of government facilities expansion as a planning tool.

Tax Provisions - Accelerated amortization of defense facilities was the second largest means of expanding production capacity in past mobilizations. Although accelerated amortization could do nothing to ensure profitable operations of the facility after the end of mobilization, it at least allowed the operators to recover their investment costs on an accelerated basis. At present, accelerated amortization would probably be ineffective in encouraging expansion of capacity.

Depreciation rates for all investments have been accelerated significantly since our past mobilizations, and marginal tax rates have been reduced significantly. Thus, even if special rapid depreciation, or even tax credits, were authorized for defense plant construction, this would probably not provide much of an incentive. Effective tax rates are already low for capital-intensive industries which would be constructing new facilities, and little could be done in the way of additional incentives.

Loans, loan guarantees, and purchase agreements - Title III of the Defense Production Act, the authority used in the Korean War to provide this form of financial assistance, remains in force, but has been modified on several occasions in ways which make it a much less attractive option. Most significant is the 1974 amendment which repealed the borrowing authority established by the original DPA, and instead required

annual appropriations for Title III. Additionally, in 1984, Congress further amended Title III to require:

- A stringent set of findings before Title III projects can be pursued (including findings that the project is essential to national security, that the capability will not be provided without Title III assistance, and that there is no more cost-effective method to obtain the additional capability -- this requirement is waived during a declared national emergency)
- Inclusion of all Title III programs in the federal budget, prior to approval, except during a national emergency
- Specific congressional authorization for all Title III commitments in excess of \$25,000,000.

The latter provision, in essence, repeals Title III except for modest projects. In the case of projects over \$25,000,000, all Title III really does is give the President permission to include facilities-expansion proposals in his budget and in authorization/appropriation proposals. This could be done without Title III so, insofar as mobilization preparedness is concerned, the legislation provides little in the way of new authority.

Even the waiver of the first two requirements during a period of national emergency is of limited value. Because of the lead time required for facilities expansion, such efforts should begin long before the outbreak of hostilities. Because of the symbolic importance of declaring a national emergency, it is likely that both the President and Congress would be extremely reluctant to make such a declaration. Thus, the waiver proves to be of very little value for mobilization preparedness.

Obviously, any law approved by Congress can be changed. Even philosophical viewpoints, such as the general opposition to government ownership of production facilities, can be changed if an adequate demonstration can be made of the national security need for the change. However, congressional acceptance of legislative proposals cannot be guaranteed, even during a national emergency, and the mere existence of these requirements substantially reduces the viability of planning for government funding of facilities expansion. Any such plans must specifically identify the legislative barriers, must analyze them in greater depth than this general survey can permit, and must contain a plan for when and how these barriers can be removed.

Other Problems - A strategy of facilities expansion can be hindered by two other obstacles:

- Priorities unemployment and other dislocations
- Industry concern about over-expansion.

During World War II, curtailment of commercial production was not matched by new orders at these factories. This was true for several reasons:

- The military favored existing contractors and, when it sought new sources, favored contracts with large industrial organizations such as the automobile industry
- Because no conversion plans had been made, the expansion of production proceeded in a disorganized manner, with little visibility of the impact of curtailment orders on individual facilities and localities.

Contracting with a smaller number of large organizations was certainly easier and provided more assurance of delivery, because it minimized the number of separate contractual actions and permitted the government to deal with organizations that were known to be reliable and qualified.

However, it also caused significant dislocations. Even before the war, the phenomenon known as "priorities unemployment" was being seen. Workers in some plants were thrown out of work when their production was terminated without matching defense orders.

This led to several other problems:

- Labor shortages in areas where new plants were being built
- Excessive migration of workers from areas where production was curtailed to areas where production was expanded
- Demand for new social services in the newly-overcrowded areas (including schools, housing, transportation), with accompanying resource demands
- Pressure by small businessmen for increased preference in contract awards.

These related problems came together to form perhaps the most bitter political controversy of the war period. The problem was not necessarily inherent in an expansion program, but primary reliance on expansion certainly made the problem worse.

Concern about over-expansion is a final problem which may inhibit such strategies. This concern is likely to be especially severe prior to conflict, when neither business nor

government will know the ultimate outcome. Because of this uncertainty, Congress may be more reluctant to fund expansion which may not be needed, and industry may be reluctant to see extensive new-facilities construction which may become an expensive "albatross" when it is no longer needed for national defense.

In his memoirs, WPB Chairman Donald Nelson described the problem that can be caused by too much expansion.

...there were those who were convinced that total war was ahead for the United States, and that we were arming not only to help the nations with which we sympathized but to preserve our own country by strong, aggressive action. They were sometimes called "expansionists" or "all-outers." They were for the quick conversion of industry, a longer-range policy for accumulation of raw-material stock-piles, a firmer and deeper organization of the economy for war... Opposed to this group were men of equal sincerity who...thought we could avoid a shooting war and that there was no need to shake our economy apart in anticipation of an emergency which would probably not occur... In OPM itself this school of thought not only retarded the importation of certain materials which were necessary in the processing of vital products such as steel and aluminum, but it also pursued a cautious course in the expansion of our manufacturing facilities... Although it turned out that they were wrong -- or so I believe -- they could easily have been right. If we had not been attacked at the end of 1941, the kind of economic dislocations which our side favored would have ruined us, because the entire industrial equilibrium of the country would have been completely upset without the valid excuse of war.* (emphasis added)

*Nelson, op. cit., pp. 125-6.

Even once conflict begins, industry reluctance to expand may persist. Industry experience in past mobilizations may prove an especially troublesome problem. For instance, one reason for the machine-tools production backlog at the beginning of the Korean War was the reluctance of the industry to go through a "boom or bust" period as it had in the past decade. In its 1952 machine tools survey, the Joint Committee on Defense Production, after summarizing the incredible production record of this industry in World War II, noted that the government had dumped "an enormous quantity of surplus tools" on the market immediately after the war. This caused a depression from which the industry did not begin to recover until 1949.* The committee identified "possibility of over-expansion" as one of the principal obstacles to increased machine-tool production in the early phases of the Korean War.†

5.4.3 Advantages and Disadvantages of Conversion

For the most part, the relative advantages and disadvantages of conversion are a mirror image of the factors affecting expansion. Advantages of conversion include:

- More balanced utilization of the economy
- More efficient utilization of resources
- Reduced time and financial cost.

However, there are also serious disadvantages. In the early preparatory phases, conversion would certainly be more visible as civil production was curtailed. As noted,

*Joint Committee, op. cit., p. 6.

†Ibid., p. 24.

industry will tend to resist conversion as long as possible, if it would mean disrupting established commercial relationships.

Historically, industry has only reluctantly agreed to convert civilian capacity to military production, especially before a declaration of war. Before World War II, for example, the automobile industry was not eager to convert its factories to war production before the U.S. entry into the war. Auto manufacturers feared that they would lose their share of the civilian market if they converted their facilities to defense production while their competitors continued to manufacture cars. Resistance to conversion may be even greater in the future because of the risk that companies could permanently lose their markets to foreign competitors.

Peacetime defense producers also opposed conversion of civilian industries. The aircraft industry bitterly opposed the government's effort to integrate the auto companies in the production of military aircraft. They feared that, after the war, Detroit would take over the commercial aircraft market. The aircraft industry agreed to cooperate after the auto companies explicitly promised not to invade the postwar airplane market.*

Defense contractors may also be reluctant to rely on inexperienced, newly-converted component suppliers. In the fall of 1940, the Air Corps determined that oleo struts fabrication was becoming a major bottleneck in the production of military aircraft. The government provided several tool companies with funds to convert their factories to the manufacture

*Holley, op. cit., p. 306.

of hydraulic shock-absorber struts. A year later, many of the new plants stood idle, while strut production continued to lag far behind demand. The aircraft builders preferred to place their orders with established strut manufacturers rather than order from new producers, even if the result was longer lead times for the delivery of the struts.*

Besides the reluctance of industry to convert, there are other potential problems with a conversion strategy. Although conversion may be less costly, forced curtailment of civilian production inevitably requires a greater degree of government control and disruption. Pursuing "planless" conversion would probably be more dangerous than a similarly-improvised expansion program because of the potential impacts on local economies and the disruption of civil production and trade patterns. Thus, until the point where materials shortages develop, conversion is probably the less-preferred option.

5.5 RESOURCE EXPANSION METHODS

The resource manager can use a variety of methods to promote conversion or expansion of defense production capacity. Methods which have proven especially useful in past mobilizations include:

- Pre-war educational orders
- Trigger orders for "front-end" bottlenecks such as machine tools
- Integration committees or voluntary agreements
- Work force expansion or labor shortage work-arounds.

*Ibid., p. 318.

5.5.1 Educational Orders

Beginning in 1939, Congress approved relatively modest funding to place educational orders "for munitions of war of special or technical design ... with commercial concerns to familiarize them with manufacture."* Not only did educational orders permit prospective contractors to practice producing military articles, but the program also provided for the government to purchase the necessary production equipment, to be kept in reserve at the factory. Educational orders also permitted new producers to experiment with the adaptation of military items to mass production techniques. Only a few million dollars had been made available before the program was overtaken by events: educational orders were translated into production contracts as rearmament began in earnest. Nevertheless, the Army Ordnance Department concluded that the program had significant value in acquainting prospective contractors with their wartime mission.[†]

5.5.2 Trigger-Order Programs

During both World War II and the Korean War, machine tool bottlenecks were acute in the initial stages of the rearmament. On both occasions, the government established "pool-order" or "trigger-order" contract programs to help break this bottleneck.

Under the terms of the Korean War program (which survived until 1969 and was revived anew in 1981), any machine

*Quoted in Campbell, LTG Levin H., The Industry-Ordnance Team (New York, Whittlesey House, 1946), p. 21.

[†]Ibid., pp. 21-22.

tool covered by a "trigger order" not ordered by private industry by the time it was completed could be delivered instead to the General Services Administration (GSA) for storage at 82 and one-half percent of "the producer's list price representing the producers manufacturing cost."* If the producer subsequently sold the tool, he kept the sales price and refunded the 82 and one-half percent received from GSA. If, instead, GSA subsequently installed the tool in a government-owned facility, it paid the producer an additional seven and one-half percent of the price.

The trigger-order contracts were considered necessary to provide initial expansion of production in anticipation of orders. Because of the difficulty of estimating requirements for machine tools, there was basically no other way to increase production without waiting for the long process of placing defense contracts and subcontracts with producers, and their subsequent identification of machine tool needs.

During the Korean war, the machine tool program was extremely successful. After a slow start, GSA placed 61 contracts, covering more than 50,000 machines, with a total value of slightly over \$800 million in a four month period.[†] The program served to stimulate production at very little cost to the government. Losses under the program during the Korean War were less than 0.7 percent of the cost of the machine tools ordered (approximately \$8 million).[§]

*Joint Committee op. cit., p. 70.

[†] Ibid., p. 31.

[§] Federal Emergency Management Agency. "Defense Production Act Programs: An Overview," January 1982.

Estimating requirements for machine tools, special tools, test equipment, and similar devices will remain a very difficult problem. Thus, it is likely that trigger-order contracts will be an important component of an expansion program for any future medium or large-scale mobilization.

5.5.3 Integration Committees and Voluntary Agreements

In all three large scale mobilizations in this century, the government considered it necessary to permit some degree of "collusion" between producers, a great deal of which would normally be forbidden by the antitrust laws. In World War I, Bernard Baruch, who favored maximum reliance on industry self-regulation, sponsored formation of numerous advisory committees and trade associations, and delegated much of the information-gathering and coordination function to these industry or government-industry groups. Similarly, in World War II and the Korean War, a large number of integration committees or voluntary agreements were formed to permit exchange of information and discussions normally prohibited by law.

Establishment of integration committees permitted maximum utilization of existing equipment and facilities and facilitated conversion of new producers. Among the uses of integration committees were:

- Balancing of component capacities and requirements among manufacturers
- Exchange of raw materials stocks
- Exchange of technical data and "know-how."

These organizations were widely used. In June 1943, 131 integration committees were in operation, including 75 working on ammunition items, 15 on small arms, 26 on tanks,

and 15 on artillery items. On V-E Day, the 82 active committees involved over 1500 prime contractors and 10,000 subcontractors.*

Similarly, in the Korean War, 77 "voluntary agreements" were approved by the Attorney General. These included:

- 31 Army integration committees
- 5 Air Force production committees
- 29 small business production pools
- 12 miscellaneous agreements.†

These agreements represented a considerable broadening in scope from the original integration committees. Air Force production committees operated similarly to Army integration committees, except that a single firm was given principal responsibility for developing an item, and used the production committee to share technical information with alternate producers. For instance, a J-47 production committee was successful in permitting technical assistance from General Electric, developer of this jet engine, to the Packard Motor Car Co. and Studebaker Corp., two firms with no prior jet engine manufacturing experience. Similarly, an F-84 production committee permitted Republic Aviation Corporation to resolve production problems at a General Motors plant in order to increase deliveries under GM's F-84 second-source prime contract.§

*Campbell, op. cit., pp. 117-118.

†Committee on Banking and Currency, U.S. Senate, "Report on Review of Voluntary Agreement Program under Defense Production Act" (Washington, Government Printing Office, February 28, 1956), p. 3.

§Ibid., p. 29.

Small business manufacturing pools permitted groups of small business firms to pool their production and technical resources in order to seek joint contracts which they might not otherwise be able to obtain. Although a number of small business pools were approved, in practice they had little success in obtaining contracts.*

Miscellaneous agreements generally "were initiated by various government agencies to obtain cooperative activity from groups of competitors to deal with a particular defense emergency problem, often of a non-military nature."[†] They included:

- Voluntary credit restraints by lenders
- Voluntary stabilization of prices by steel producers
- Tanker capacity agreements
- Foreign petroleum supply agreements.[§]

Integration committees and voluntary agreements raised serious legal issues. During World War II, WPB Chairman Donald Nelson certified to the Attorney General that the Army's integration committee program met WPB criteria, and that actions under the committees "in compliance with my approval of the program, is requisite to the prosecution of the war."^π Legal assistance was also provided to the committees

*Ibid., p. 9.

[†]Ibid., p. 8.

[§]Ibid., pp. 10-11 and 30-31.

^πCampbell, op. cit., p. 126.

in exempting them from priorities regulations so that they could exchange materials.

In the Korean War, the Defense Production Act authorized voluntary agreements under fairly broad terms. Any action under a voluntary agreement approved by the President was immune from prosecution. Approval of the Attorney General was required for all voluntary agreements, but his function was more or less limited to performing general surveys to determine whether voluntary agreements were promoting monopolistic or anticompetitive practices.*

In view of the need for conversion and expansion of production, voluntary agreements and integration committees certainly will be required in any future mobilization. Indeed, a strong argument could be made that establishment of such agreements in peacetime, on a standby or in-being basis, would be a prudent preparatory action for mobilization.

5.5.4 Expanding and Controlling the Workforce

In past mobilizations, there were two major resource management issues associated with manpower, as well as a number of issues perhaps less important to future resource management planners. The two key issues were:

- Overall limits in the workforce, either on a gross basis or in particular skills
- Labor distribution problems, causing labor surpluses in some areas and shortages in other areas.

*This provision continues in force to this day, but has been restricted significantly on several occasions, most recently in 1975.

Managing this critical resource is difficult for two reasons. First, the workforce is the only form of resource which votes and has representation in Washington, limiting the flexibility of resource management planners. In addition, members of the workforce require social services (e.g., housing, recreation, schools, medical services) which further restricts the mobility of this resource and creates new resource demands when it is moved.

Table 5.5-1 shows the overall breakdown of the workforce in selected months during the rearmament period and the war years.

TABLE 5.5-1
GROWTH AND DISTRIBUTION OF THE LABOR FORCE
DURING WORLD WAR II -- SELECTED MONTHS

	Apr 1940	Sept 1940	Sept 1941	Sept 1942	Sept 1943	Sept 1944	Apr 1945	July 1945
Total labor force, including Armed Forces....	55.1	56.8	58.8	61.1	65.7	66.8	66.3	67.5
Armed Forces.....	.3	.5	1.8	4.6	9.7	11.7	12.1	12.1
Civilian labor force.....	54.8	56.3	57.0	56.5	56.0	55.1	54.2	55.4
Unemployment.....	8.2	6.8	4.7	1.7	.9	.6	.5	1.0
Employment.....	46.6	49.5	52.3	54.8	55.1	54.5	53.7	54.4
Agricultural.....	9.4	10.8	9.9	9.5	10.0	9.7	8.7	9.9
Nonagricultural.....	37.2	38.7	42.4	45.3	45.1	44.8	45.0	44.5
Munitions industries.....	4.2	4.7	6.5	8.8	10.9	10.2	10.1	9.2
Other manufacturing.....	6.2	6.6	7.5	7.4	7.2	7.0	6.9	6.9
Federal war agencies.....	.1	.1	.4	1.1	1.6	1.7	1.7	1.6
Other government.....	3.9	4.0	4.2	4.3	4.0	4.0	4.0	4.0
Transportation and public utilities..	2.9	3.1	3.4	3.5	3.7	3.8	3.8	3.9
Construction.....	1.1	1.5	2.0	2.5	1.5	1.1	1.1	1.2
Mining.....	.9	.9	1.0	1.0	.9	.9	.8	.8
Trade and service.....	11.6	12.0	12.9	12.6	12.5	12.6	12.6	12.8
Other.....	6.2	5.7	4.5	4.1	2.8	3.4	4.1	4.1

Source: Prepared by U.S. Department of Labor, Bureau of Labor Statistics, as cited in U.S. Congress, Legislative Reference Service, op. cit., p. 211.

Several significant facts about the workforce are apparent in this table. Most important, the workforce expanded dramatically during the war. While the armed forces increased substantially, this expansion was not at the net expense of the civilian workforce until the very end of the war. Although the unemployed were an important source of workers (accounting for 7.3 million new workers between April 1940 and September 1943), more significant yet was the addition of 10.6 million new workers to the labor force in that same period. This net addition of 17.9 million to the effective workforce permitted the maintenance or expansion of civilian sectors (no sectors except "unemployed" and "other" declined in total employment between the base period and September 1943) while still building up the armed forces.

Three methods are available to expand the industrial labor force:

- Training programs, to upgrade skills
- Utilization of personnel not previously in the workforce (women, unemployed, retired, students, aliens, prisoners)
- Occupational deferments or furloughs from military service.

All of these methods were used to some degree or another in prior mobilizations. The second category was especially important. For instance, the number of women in the labor force increased from 14.6 million in 1941 to 19.4 million in 1944; in addition, 1.5 million already employed were transferred to jobs in defense industries.* Efforts were also increased to promote opportunities for black Americans,

*Fairchild and Grossman, op. cit., p. 172.

response to pressure from civil rights advocates.* In 1941, President Roosevelt signed an executive order barring racial discrimination by war contractors; given the customary practice of almost total racial segregation which existed at the time, efforts to promote job opportunities for blacks were not very successful.

Foreign workers were actively recruited by the U.S. government, especially for agricultural labor. Agreements were signed with a number of governments, including Mexico, the Bahamas, and Jamaica. By the end of the war, over 60,000 Mexicans and 26,000 Jamaicans and Bahamians were employed on American farms; an additional 50,000 Mexicans were employed on American railroads.†

Smaller numbers of non-residents were employed in industry. For instance, 8,700 residents of the British West Indies were employed in industry, including 1,900 in foundries and forges. Three-hundred Jamaicans worked at the Picatinny Arsenal and about 1,500 were employed in other ordnance plants.‡

Employment of all of these groups fostered problems, including racial prejudice, housing and social service shortages, and absenteeism. Absenteeism ran especially high among women, due to child care and similar problems.

One final method, which was not widely used in World War II, was to grant occupational deferments to essential workers. This is a difficult issue, especially during a time partly as a measure to increase the workforce, and partly as a

*Ibid., pp. 156-168.

†Ibid., p. 179.

‡Ibid.

of mobilization when virtually any trade or occupation can claim to be essential to the war effort. Because exemptions were already granted on the basis of age, marital status, and dependency, local draft boards were not inclined to open up a broad new category of exemptions. Until late in 1943, exemptions were granted only on an individual basis, rather than on an across-the-board industrial basis. Certain industries with an especially young labor force, such as aircraft and merchant marine, were especially hard hit.

To remedy spot shortages, the Army established a practice of granting furloughs to workers to permit temporary resumption of civilian employment. This was first used in the fall of 1942, when a large number were released to work in mines. Furloughs were also used to permit soldiers at nearby bases to harvest crops.

Coping with Local Labor Shortages - Besides general national labor shortages in particular skills, mobilization caused significant local labor shortages. Ignoring labor market issues created a variety of social problems: migration of labor, shortages of housing and social services, overcrowding, etc.

Other issues besides labor shortages were also involved in plant siting and contract distribution. Small businessmen whose production had been terminated advocated spreading contracts and subcontracts to permit utilization of their facilities.

Early in the rearmament program, when many new plants were built, labor concerns were only a secondary matter, and many plants were built in areas that later had severe labor shortages. Many factors affected plant siting. Some agencies

wanted to build their facilities near existing industrial centers, which often had serious labor shortages. Many ordnance plants were built in areas where they had to compete with other war industries for labor. Nearly all machine gun plants and the centers of the aircraft industry (generally built around existing plants) were in severe labor shortage areas. One particularly serious problem area was Detroit, where a number of new aircraft facilities were built. Some experts concluded that the concentration of so many facilities in Detroit (particularly the Willow Run facility) was a grave mistake.

In October 1943, the War Production Board ordered that no plant expansion be permitted in labor shortage areas without special clearance. War Department policymakers also argued for consideration of labor supply in plant siting, and even urged re-locating some facilities out of these areas. However, too many other factors entered into plant siting decisions, and the labor shortages persisted until 1945, when contract cutbacks began.

Distribution of contracts was also only partly successful. As early as 1940, the NDAC advised that labor availability should be a principal factor in contract awards. Despite this, contracts were awarded principally to large firms that historically supported defense, and it was estimated that 75 percent of contracts in 1940 were concentrated in areas containing only one-fifth of the population. In September 1941, FDR issued an Executive Order to provide for more effective use of existing plants and for efforts to alleviate chronic unemployment. However, contract distribution was never successful due to a large number of factors, including procurement officers' desire to work with established customers, competition between military departments for utilization of selected facilities,

lack of data as to production capabilities of prospective firms, and the inertia in a system which required placement of millions of war orders.

A memorandum from a special assistant to Secretary of War Stimson summarized the situation:

Two extreme views exist. One is the military point of view. That is that it is the Army's task to obtain the materials in the best and speediest way possible, which very often is from large, experienced, financially sound producers, and in such procurement no regard should be paid to the relief of any distressed industry or distressed community. The other extreme view is that of some social workers, and some businessmen, that the defense effort should be so gauged as to afford relief to business or communities which have previously needed relief, or which now need relief because of priorities, and that in part at least, the program should take on the aspects of the old Works Progress Administration.*

Table 5.5-1 vividly demonstrates the stress which had been placed on the workforce by the end of the war. Many commentators have suggested that by 1944, the U.S. had nearly reached the mobilizable limits of its labor force, at least under the general "guns and some butter" approach adopted to fight World War II.† Although the labor force continued to expand through September 1944, the total civilian labor force began to decline three years earlier. More significantly, by the third year of civilian labor decline, reductions in unemployment could no longer compensate for the loss. Civilian

*Connery, op. cit., p. 119.

†See, e.g., Civilian Production Administration, op. cit., p. 714 and Legislative Reference Service, op. cit., pp. 210-11.

employment showed a year-to-year decline for the first time between September 1943 and 1944. Unemployed and newly-employed workers could no longer provide sufficient resources to "backfill" for those drawn off for the armed forces.

Manpower emerged as one of the most limited resources in World War II. While there is considerable flexibility even in the availability of this resource, more effective methods might be needed in any future mobilization if the armed forces and production requirements approached the scale of World War II.

5.6 SUMMARY

Because of the limited additional capacity of defense producers, any significant production increase will require measures to convert or expand capacity. Either strategy provides important opportunities for expanding production, and potential problems for the resource manager.

Expansion -- building new facilities or expanding existing ones -- is considerably less disruptive to the national economy than conversion, but consumes relatively greater quantities of critical resources to create additional productive capacity. Expansion to achieve defense production goals permits the continued production of a full range of civilian goods, but requires relatively more time to achieve than conversion. A potential impediment to expansion is resolving the question of who pays the costs. American industry historically has been reluctant to pay for expanded defense capacity, but a number of effective methods have been used in past mobilizations to resolve this problem.

In theory at least, conversion of existing civilian production facilities to defense needs avoids much of the lead time required for expansion. However, historically, conversions have involved requirements for new equipment and manpower retraining on a scale which has been comparable to expansion. Nevertheless, conversion offers the substantial advantages of existing supplier networks, manpower pools, and management structures.

Conversions also pose unique problems. Because industrial mobilization requires very long lead times, initial actions in order to be timely will have to be taken during a period of ambiguous warning. Converting civilian goods producers during such a period will meet considerable resistance with regard to market shares and customer relationships. Businesses are most unwilling to have their competitive positions eroded in a situation where the national need is unclear.

Conversion and expansion both involve drawing resources from the civilian economy and are, therefore, inherently civil agency coordinating functions. DoD presently does little of this planning -- except with selected individual producers -- focusing instead on near-term surge responsiveness.

Planless conversion/expansion programs could risk economic disaster, or at least substantial delay in mobilization. These initiatives must be correlated with the requirements approval process and with allocation/curtailment decisions.

TASC's historical survey indicates that improved policies and legal authorities can have a significant impact on resource management and on resource availability. Priorities systems can provide a certain degree of preference for defense orders, expedite production, and provide a mechanism for resolving production bottlenecks. More vigorous measures, including mandatory conversion, allocation of materials, limitation orders on non-essential production, and waiver of limiting national policies, can markedly increase the flow of resources for defense production. This chapter considers policy actions or decisions which may be needed to provide such authorities, organizations needed to orchestrate production, and legal and political constraints which could impede the availability of needed resources.

Mobilization planners have often assumed that there is a single "right" way to structure industrial mobilization. Historical experience strongly suggests that it is impossible to have a single right answer which can cover every possible contingency, every President's preference, and every possible policy determination.

Planners must guard against drawing the wrong conclusions from past mobilizations. Some assume, for example, that the lesson of the Korean-era mobilization is that there was a "correct" answer in 1950 and that the same solutions, with fine-tuning to reflect changed circumstances, would work again. Obviously, the question of proven methods which are necessary to control the economy and coordinate mobilization

is not entirely irrelevant to development of policy. A planner's determination of tools and techniques needed to accomplish his mission will be one important determinant of the ultimate package of authorities, plans, and programs.

However, three other factors will have an especially important impact on the course of mobilization. Planners, especially at a working level, have limited control over these factors. They are:

- The nature of the emergency. There is clearly some relationship between the intensity of the emergency and the measures needed to manage resources. Smaller emergencies require less stringent controls, and the intensity of such controls is likely to increase with the intensity of the crisis
- Presidential political style. Different administrations have different approaches, political philosophies, and styles of dealing with public policy issues, the Congress, and the public. President Roosevelt demonstrated during the Depression a preference for improvising and for creating new "alphabet soup" agencies to deal with any newly-identified problem. Planners probably should have anticipated a similar approach to mobilization in his term of office. The planner probably cannot have much control over any Administration's preferences; however, it would be imprudent not to adjust plans to accommodate these preferences
- Politics and interest group pressures. Congressional style and interest group pressures will play a significant role in shaping mobilization policy. This report cannot consider in depth the characteristics of the present-day Congress which would affect mobilization policy, except to note that the decentralization of Congressional authority,

the growing interest group "gridlock," and many other factors would have an enormous impact on mobilization policy and programs. Similar pressures have always exerted influence.

Mobilization planners frequently ignored these realities and prepared plans which unrealistically appeared to assume that:

- The preparer of the plans will play a central role in managing resources
- The President will agree to implement the proposed plans exactly as proposed
- Political controversies, interest group pressure, and interagency conflicts will not affect mobilization programs
- Desirable mobilization authorities will be forthcoming in the manner requested, promptly when they are requested.

Section 6.2 discusses three past planning exercises which failed because the planners ignored these problems. The remainder of this Chapter discusses the effect of politics on policies and organizations -- bureaucratic and legislative. These effects are intensified by mobilization but act on planning as well. The organizational structures for the management of past mobilizations primarily has been an outgrowth of this process.

6.1 THE IMPACT OF POLITICAL FACTORS

Planners often assume that the normal processes that produce decisions in Washington -- intense lobbying and brokering between varying interest groups, rival political

factions, and different government agencies -- will be suspended during a national emergency. Many assume that peacetime rivals and interest groups will "rally 'round the flag" and support the Executive's mobilization efforts in wartime. In fact, a review of history shows that, if anything, political pressures and controversies concerning the defense program were intensified once mobilization began. This is understandable; as the importance of government decisions increases, and as resources become more limited, the power of government to hurt or help sectors of a pluralistic society grows correspondingly. The historical literature shows many examples where one group or another expressed a willingness to make proportional sacrifices in the national interest, but then proceeded to claim that they were being asked to make disproportional sacrifices. For instance, one Korean War historian noted:

...businessmen from a great variety of enterprises testified that, in principle, they favored price and wage controls, but urged a special exception for their particular businesses, which were unfairly hurt by such controls.*

Another historian concludes:

Indeed, the likelihood is that each group will seek to retain its advantages and to use its essential place in the war effort to improve its position relative to other groups. No group may be expected to look with favor on any war policy which threatens its position in the post-war period. While the war is in progress, organized labor will seek to expand and consolidate its gains, as will agriculture in its own behalf, while business

*Marcus, M., Truman and the Steel Seizure Case (New York, Columbia University Press, 1977), p. 28.

may seek to cancel out some of the gains of labor and to bring in a new discipline under the aegis of war necessity. Political parties, whatever their unity in regard to war policy, continue their rivalry with a sharp eye ever on the nearest election dates ...*

Political pressures, broadly defined, can have a variety of impacts on the shape of a mobilization. These include impacts on:

- The ability to take any action at all
- The scope of authorities and programs
- Relief and exemptions from national policies
- Implementation of "social goals."

6.1.1 Taking Action

The U.S. involvement in Vietnam is perhaps the best-known instance where domestic political factors restricted the ability or desire of the U.S. Government to undertake mobilization actions. In July 1965, when U.S. force involvement stood at approximately 80,000 soldiers, both the Joint Chiefs of Staff and the Secretary of Defense recommended that President Johnson seek public and congressional support for the growing U.S. involvement, undertake selected mobilization actions, and call up Reserve and National Guard forces to preserve the balance of the existing force structure. In a July 13 news conference, President Johnson acknowledged the possible need for such actions:

*Louis Smith, op. cit., p. 63.

Any substantial increase in the present level of our efforts to turn back the aggressors in South Vietnam will require steps to insure that our reserves of men and equipment of the United States will remain entirely adequate for any and all emergencies.*

However, despite a report from the Attorney General supporting the President's legal authority to commit the Reserves without congressional authorization, President Johnson decided that he did not want to spur a national debate on the war. Instead, the war would be fought "below the threshold." Fearing that a major debate over war authorities, expenditures, and activation of politically-powerful Reserve units would endanger the Great Society, he decided to adopt gradual tactics, to utilize existing stocks of equipment, to transfer funds from other accounts, and thus to minimize the need to involve Congress in debates on the U.S. role.[†]

The historical survey shows that this pressure on Executive actions was not an aberration. Early preparedness actions before U.S. involvement in World War II were similarly constrained by domestic political factors. When President Roosevelt rejected the Army-Navy Munitions Board (ANMB) mobilization plan and the War Resources Board (WRB) recommendations, he expressed his belief that the climate was not right, in late 1939 and early 1940, for a great national debate on U.S. preparedness. (See Section 6.2.) At that time, a request for the new legislation inherent in the plan and in WRB recommendations was likely to set off partisan conflicts, arouse fears of

*Quoted in Berman, op. cit., p. 122. This book contains an extensive description of the internal debates during this period on the dimensions of U.S. involvement in Vietnam.

[†]Ibid., pp. 125-127.

isolationists, and crystallize emerging controversies over control of the rearmament program. Included were those between industrialists and labor, between military and civilian leadership, between rural and labor interests, and between industry and New Deal advocates.* If anything, such a debate might have resulted in further restriction on his ability to act.†

Instead, President Roosevelt reached back to legislation remaining on the books from the World War I preparedness period, the Army Appropriations Act of 1916 (an act which continues in force to this day), and revived the Council of National Defense. This cabinet-level committee served as an administrative convenience to appoint an Advisory Commission, also permitted under the Act, which served as the first of a continuing series of mobilization policy and management agencies. Out of these first hesitant steps, the U.S. wound up, nearly two years later, substantially prepared for war, even though the political environment early in 1940 precluded high-visibility preparatory actions.

Similarly, other pre-World War II preparedness actions were hesitant and tentative. Certainly, planners lacked the knowledge and experience to apply past lessons, a factor future planners can hope to alleviate. However, the hesitancy was partly caused by factors beyond any planner's control, such as:

- The political divisions in the country, discussed above, which limited President Roosevelt's ability to take vigorous rearmament steps

*Connery, op. cit., p. 79.

†Bureau of the Budget, op. cit., p. 23.

- The reluctance of industry to expand or convert, easy to understand given industrialists' still-recent memory of the "Merchants of Death" witch-hunts of the mid-1930s and their reluctance to abridge commercial production and invest in war production capacity for a war which might never come.

In the same vein, the evolution of management structures was partly due to inexperience and "learn-as-you-go," but was also partially attributable to a distinct Presidential management style, a reluctance on the President's part to delegate too much authority to persons who had not yet been thoroughly tested, and a variety of political and interest group forces which pressured for preservation of their own role in society and protection of their interests.

6.1.2 Political Impacts on Authorities and Programs

Even after combat begins, political constraints continue to limit resource management programs. This tendency may be especially true in limited wars, when the scale of the war and its limited aims may not appear to justify the sacrifices demanded by the government.

This problem was noted in the Korean War:

Because of the ambiguous nature of the Korean conflict and the limited scope of both the national emergency and the mobilization, no segment of the public was willing to make the sacrifices required to halt inflation. Labor wanted compensation for every rise in the cost of living, as well as for increased productivity. Businessmen insisted that their profit margins be protected. And Congress, as will be seen, succumbed to the view that major sacrifices were not needed,

thus weakening the control program it had approved in 1950.*

One perceptive observer noted that Congress, during World War II at least, "was perhaps less concerned with broad principles of administrative organization than with the manner in which the economic position of certain groups and commodities was being affected by the war."[†] This reflection of constituent interest is a natural Congressional function which is unlikely to change. It can affect implementation of resource management programs. For instance, in World War II, pressure was applied by Congress and interest groups for increased consideration of farmers' needs (in terms of new equipment, labor, and farm prices), for both pro-labor and anti-labor employment policies (issues such as overtime pay, union organizing and membership rights, right-to-strike, "work-or-fight," etc.), about general management of the war, for and against implementation of price, wage, and rent controls and rationing programs, and for and against various solutions to the rubber problem.[§] Some observers regard these concerns as secondary and distracting. However, a concern of prime importance is the redistribution of power inherent in granting the President the "dictatorial" authority to seize plants, appropriate resources, and create or destroy economic relationships. These powers go far beyond the role envisioned for the President in the U.S. Constitution and justify strong Congressional concern. Difficulties arising between the Congress and the President in each of the mobilizations of this century can trace a part of their origin to this concern.

*Marcus, op. cit., p. 15.

[†]Young, R., Congressional Politics in the Second World War, (New York, Columbia University Press, 1956), p. 34.

[§]Ibid., pp. 35-37.

Despite the continuous pattern of congressional and interest group intervention, mobilization planners have often shown a desire to "wish away" these elements of society. By 1948, mobilization planners seemed to be assuming that the lessons of prior mobilizations were so precise that the planner could predict the exact shape of a future mobilization and draft a law which would provide the necessary authority. There also appeared to be a secondary assumption that legislative authority should be obtained to resolve any ambiguity about the availability of authorities.

The first manifestation of these assumptions was the draft "Emergency Powers Act," prepared in 1948 by the staff of the NSRB. This Act, or portions of it as needed, was intended to be submitted to Congress upon declaration of emergency. The Act contained 20 titles, dealing with subjects such as coordination of executive branch agencies, emergency contracting authority, priorities and allocations, plant seizure, import and export control, and economic stabilization. Until recently, this general approach was retained in a draft "Defense Resources Act," an omnibus legislative proposal also intended to be introduced at the time of an emergency.* As a standard component for many years, pre-exercise scenarios provided for Congress to approve the DRA, in toto, the same day it was submitted to Congress. This action, generally timed to occur the day before the exercise began, would then trigger a more or less automatic outburst of pre-written Executive Orders, proclamations, and delegations, all of which cited the DRA as principal authority.

*For a discussion of the DRA, see Reed, L. S., Legislative and Administrative Problems Affecting the Defense Industrial Base, (Washington, The Analytic Sciences Corporation, TR-3861, 1982), pp. 2-13 - 2-40.

There were several problems with this approach to legislative authorities:

- To the extent new authorities are genuinely needed, this approach might deny these needed authorities in the critical pre-conflict buildup period
- It could promote inflexible planning built around one specific set of organizational policies and authorities, with little flexibility for implementation in other environments
- It ignores the need for time to process legislative requests and the risk that requests will be denied.

In reality, past mobilizations have shown that Congress has continuously inserted itself into questions regarding mobilization policy and management issues. Legislation has not been approved in one burst, but rather has been subject to continued modification throughout the war. Some of this turbulence could be attributed to "trial and error" (which could presumably be corrected through better and more thorough planning), but much was due to genuine policy disputes.*

The Defense Production Act (DPA) of 1950, principal war powers authority for the Korean War, is frequently cited as a "successful" war powers act. Indeed, the draft Emergency

*Connery, op. cit., pp. 464-514, contains a useful compendium of policy decisions and legislative enactments in World War II. George Nicholas, ed., Washington Despatches, a series of messages from the British Embassy in Washington back to the foreign office, also provides useful insights into the Washington political scene during this same time period.

Powers Act contributed to the speedy drafting of the DPA (as well as other temporary statutes such as the tax amortization legislation), and the DPA was approved relatively rapidly for a major piece of legislation. (Table 6.1-1 displays the principal titles and current status of the DPA.)

However, this by no means meant smooth sailing for the administration of war programs. Special interest provisions were added throughout the war, and the Act was in a continuous state of modification. Congressional sources regularly gave pointed "advice" to the mobilization authorities. For example, shortly after passage of the Act, the Joint Committee on Defense Production clamored loudly for prompt application of economic controls (authority for these had not been requested by the Truman administration, but had been provided by Congress anyway). However, throughout the war, controls were criticized by some Congressmen and were substantially watered down only nine months after the DPA was originally enacted. Then, with the election of an anti-controls administration in 1952, controls were abandoned early in 1953.

Similarly, the Joint Committee argued for establishment of a small business office within the National Production Authority, an agency within the Commerce Department. Yet, within six months, the DPA was amended to establish an independent Small Defense Plants Administration (which later became a permanent agency, the Small Business Administration).

TABLE 6.1-1
DPA PROVISIONS AND CURRENT STATUS

<u>Title</u>	<u>Authorities</u>	<u>Disposition</u>
Title I: Priorities and Allocations	Priority contract performance	Still in effect
	Allocation of Materials	Still in effect
	Prevention of hoarding	Still in effect
	Agricultural product import restrictions	Added in 1951; repealed in 1953
Title II: Requisitioning and Condemnation	Authority to requisition	Repealed in 1953
	Authority to condemn	Added in 1951; repealed in 1953
Title III: Expansion of Productive Capacity and Supply	Purchase agreements, loans and loan guarantees, installation of equipment, etc.	Still in effect
	Use of Treasury borrowing authority to finance projects	Repealed in 1974
Title IV: Price and Wage Stabilization		Repealed in 1953
Title V: Settlement of Labor Disputes		Repealed in 1953
Title VI: Control of Consumer and Real Estate Credit	Control of consumer credit	Repealed in 1952
	Control of real estate credit	Repealed in 1953
Title VII: General Provisions	Small business encouragement	Still in effect
	Authority to create new agencies, issue regulations, gather information	Still in effect
	Small Defense Plants Administration	Replaced by Small Business Administration, 1953
	Voluntary agreements (Waiver of antitrust)	Greatly restricted in 1975, but in effect

6.1.3 Implementation of Social Programs

Implementation of social goals in wartime is one example of domestic political factors at work. Mobilization planners have frequently assumed that laws to implement social policies should be considered expendable to the war effort during a national emergency. This belief has been carried forward to the present day. The draft Defense Resources Act, until recently the principal stand-by legislative vehicle for mobilization authorities, provided broad authority to the President to suspend laws and regulations. The Act provided in its statement of purpose that only "when feasible and consistent with the primary objective of efficient mobilization of the national resources for defense purposes" should "due consideration" be given to moderating influences such as maintenance of labor standards and collective bargaining.

TASC's historical survey suggests strongly that planners would be imprudent to develop resource management plans on the assumption that such social policies will be set aside. Indeed, there is more evidence to suggest that wartime mobilization programs have served as instruments to advance these social causes.^{*} During World War II, organized labor had a powerful voice in Washington and sustained pre-existing labor standards, policies, and union organization rights. Although the efforts were only partially successful, World War II saw some of the first organized civil rights pressure; in response to this pressure, the Roosevelt administration issued Executive Orders banning discrimination in war plants.

Many of the broad industrial relations requirements which now apply to Federal contracts were applied during World

^{*}Abrahamson, op. cit., argues this point particularly strongly.

War II, and analogues for several present-day employment-preference programs can be found in Office of Defense Mobilization (ODM) issuances during the Korean War. For instance, Defense Manpower Policy No. 4, which provides for some contract award preference in "labor surplus" areas, was first promulgated by ODM during the Korean mobilization.* In 1953 alone, ODM issued the following policy directives related to labor practices:

- Defense Manpower Policy (DMP) No. 7 -- providing for more effective utilization of older workers in the defense program
- DMP-9 -- calling for emphasis on increasing opportunities for handicapped workers and more effective use of such workers in the mobilization program
- DMP-11 -- providing for special assistance to returning Korean War veterans in obtaining suitable training or employment.†

Similarly, concern about the impact on constituents of curtailment orders has led to political interest in contract distribution, priorities, local labor shortages, small business utilization, and similar issues. Congressional interest in these issues is shown in the following:

*However, political factors prevailed a second time with regard to this policy. Implementation of DMP-4 was blocked by southern Senators who opposed the use of this policy to subsidize high-cost New England textile mills. Shortly after the policy was issued, Congress enacted the "Maybank" amendment, which prohibits paying premiums to labor surplus area firms.

†ODM submission to Third Annual Report, Joint Committee on Defense Production, U.S. Congress (Washington: Government Printing Office, 1954), p. 71.

These larger aspects of the industrial mobilization, however, were not the factors that stimulated congressional interest in the small businessmen. It was the very practical consideration that their constituents might be forced out of business because of inability to obtain either raw material to manufacture civilian goods or defense contracts for war supplies. As the manufacture of one civilian product after another was banned by the Office of Production Management, there was increasing pressure from Congress on the President and the armed services to award more contracts to the small producers. In a sense this was a fortunate circumstance in that it directed attention to the importance of drawing all parts of the national industrial system into the mobilization, but it was an immediate headache to all concerned.*

Of course, these programs were justified, at least in part, as providing for more effective mobilization by expanding the workforce or promoting full utilization of existing capacity -- and indeed they did. In contrast, parallel present-day programs are generally justified as social programs. However, the distinction is unimportant; in a future mobilization, groups perceiving themselves as disadvantaged can be expected to press for some type of special treatment and to justify these privileges at least in part as contributing to the mobilization program. As in the past, these voices will continue to be heard in Washington.

6.2 THE POLITICS OF PLANNING FOR MOBILIZATION MANAGEMENT

Ever since the approval of the National Defense Act of 1916, the nation has had an official policy to maintain peacetime plans for industrial mobilization. Presently, the

*Connery, op. cit., p. 116.

principal legislative authority for industrial mobilization planning is found in the National Security Act of 1947. This Act establishes a peacetime planning and advisory function (now resident in the Federal Emergency Management Agency) but remains silent as to the shape of mobilization management.

The tendency of peacetime planning organizations to assume that they will play a central role in managing the future mobilization has been seen on at least three separate occasions:

- The Army-Navy Munitions Board, in preparing its 1930s mobilization plans, assumed that the central war coordinating agency would grow out of the ANMB
- The War Resources Board, appointed in 1939 by FDR to review the adequacy of the ANMB plans, recommended that any subsequent mobilization could be handled by "patriotic businessmen," (such as themselves, in a configuration such as the WRB)
- The National Security Resources Board, established in 1947 as an advisory body to the President on mobilization preparedness, made proposals to President Truman providing for a central management role for itself.

In all three cases, the President rejected the proposals. Each of these rejections was based on the planner's failure to take into account one of the critical factors mentioned earlier:

- The nature of the emergency
- Politics and interest group pressures
- Presidential political style.

The following sections discuss these three cases.

6.2.1 Army-Navy Munitions Board Plans

One critical flaw in the ANMB plans was their assumption that the mobilization would spring full-blown upon declaration of war. New agencies would be created to manage the mobilization, legal authorities would be asked for and approved, and war materiel would come pouring out. In 1939, when FDR decided to begin preparatory efforts, the situation would not permit such actions. War had just begun in Europe, and substantial opposition to U.S. involvement existed, from both pacifist and isolationist camps. Only hesitant first steps could be taken, not an all-out mobilization. In this context, the ANMB "M-Day" plan had very little relevance.

Additionally, as noted earlier, the plans appeared, to FDR, to delegate too much authority to an as-yet unnamed subordinate and to give too much control to business leaders who had been his political opponents. For all these reasons, he could not implement the plans.*

6.2.2 War Resources Board

The findings of the WRB, similarly, were unsatisfactory in the context of the time. One principal fault of the WRB was its apparent insensitivity to political "turf." The Board, appointed by its chairman, U.S. Steel Chairman Edward R. Stettinius, was composed of three business leaders, the head of the Brookings Institution, and the head of the

*A particularly useful discussion is found in Blum, Albert A., "Roosevelt, the M-Day Plans, and the Military Industrial Complex," Military Affairs, April 1972, pp. 44-46.

Massachusetts Institute of Technology. No representatives of organized labor were included, nor were any principal supporters of the New Deal. One commentator concluded:

The theme of anti-New Dealism seemed to run strongly through (the WRB report) ... Its recommendations seemed to indicate the belief that the President should turn over the management of the war on the home front to men who had been his political opponents. For example, patriotic businessmen ought to run industry during a war.*

The report also recommended that a war "might require the temporary abandonment of some peacetime objectives of the government."[†] It recommended that consideration be given to removing restrictions which might hinder mobilization, including laws such as the Davis-Bacon and Walsh-Healy acts, which represented important recent victories for organized labor in the fields of labor standards, pay, and employment practices. And, it recommended that the war effort be managed by temporary agencies (staffed by businessmen brought in temporarily), largely by-passing existing government agencies (which, as it happened, were headed by New Dealers).

Viewed in the narrow context of mobilization planning, these recommendations seem unexceptional. However, in the context of the political environment, these recommendations infuriated everyone: isolationists and pacifists, opposed to war preparation; conservatives, opposed to centralized government power; and organized labor and other supporters of the New Deal, opposed to the suggested by-passing of the President's supporters.

*Connery, op. cit., p. 49.

[†]Ibid., p. 48.

6.2.3 The National Security Resources Board (NSRB)

The NSRB, established as an advisory body to the President by the National Security Act of 1947, was one of the few mobilization planning or management agencies ever to have a statutory charter. Situated in the Executive Office of the President, it was expressly conceived as a relatively small advisory body.

However, plans developed in the pre-Korean War period assumed a major coordinating role for the NSRB. The Industrial Mobilization Plan for 1947 concluded that the Office of National Mobilization, to be established as the central mobilization coordinator with authority over economic stabilization, war production, and manpower, would be an outgrowth of the NSRB and headed by the NSRB's director. Although the law clearly confined the NSRB's responsibilities to advising the President, the NSRB felt that its mission was to maintain skeleton organizations to be scaled up to manage future mobilization efforts. The issue first came to a head in March 1948, when the Chairman of the NSRB proposed adding language to the draft Selective Service Act requiring the Director of Selective Service to adhere to NSRB policy determinations. President Truman denied this request, stating that granting NSRB executive powers would dilute its advisory capabilities and that placing such authorities in statutes would restrict future Presidential flexibility.

Nevertheless, the NSRB persisted in pressing for an operational role. An organization chart approved in May 1948 showed that the functional divisions of the NSRB were conceived

as the nuclei of war management offices.* At the same time, a package of proposals submitted to President Truman suggested submission of standby legislation to Congress providing that:

The legislative history of the National Security Act, past experience, and the preponderance of opinion of leading authorities in this field indicate the advisability of designating the National Security Resources Board, subject to the President, as the governmental agency charged with the integrating and coordinating functions (of federal activities for war preparedness).†

Again, President Truman disapproved the proposal. He reiterated his view that the NSRB should focus on long-term plans, on advising the President with respect to national security implications of federal actions, and similar activities.

Still, the NSRB was reluctant to accept this assignment. As late as December 10, 1948, in a briefing to the President and the NSRB members, the NSRB chairman stated:

... among the major organizational assumptions upon which our planning is based is that when mobilization for war is necessary, the President will wish to delegate the authority and responsibility for organizing and directing the civilian economy. Logically, the organizational framework for the discharge of this responsibility should emerge from the National Security Resources Board.§

*Yoshpe, Harry B., A Case Study in Peacetime Mobilization Planning - The National Security Resources Board, 1947-1953 (Washington, Government Printing Office, 1953), p. 30.

†Quoted in ibid., p. 26.

§ Ibid., p. 31. Yoshpe notes without comment that the NSRB Chairman resigned on December 15, 1948, five days after this briefing.

6.2.4 Summary

The rejection of these plans did not always mean the total rejection of the organization that prepared them, nor did it result in total rejection of the underlying concepts. Two of the above-described organizations, the ANMB and the NSRB, continued to function after their proposals were rejected; indeed, the ANMB played an important role, confined to the military sector, in the World War II mobilization. The plant surveys carried out in the 1930s proved useful for contracting and conversion. And, many of the concepts advocated in the ANMB plans ultimately were implemented.

However, the final verdict on any planner is not whether he prepared a "good" plan. Instead, one must ask whether the plan was accepted, whether it was effectively used, and whether the use of the plan facilitated mobilization programs. In this respect, these pre-war planning efforts were unsuccessful. These episodes do not teach that the pre-war planner will inevitably be supplanted. Rather, they show that his plans must recognize political realities, Presidential management style, and the need for flexible approaches. Clearly, there is a place in mobilization management for the pre-war planner, but he will not occupy this place if his plans are rejected.

In the case of pre-World War II mobilization programs, the rejection of the ANMB plans appears to have had far-reaching consequences. Writing after the war, War Production Board chairman Donald Nelson observed that civilian planners had tended to assume that they must develop policies, programs and procedures from scratch, rather than taking advantage of existing concepts and plans.

6.3 GOVERNMENT ORGANIZATION FOR MOBILIZATION

Within this general framework of organizational uncertainty caused by political factors beyond the planner's control, there are two factors of critical importance to the organization of government for mobilization. The first and most critical is the need for a central manager of the economy. The second is the need for coordination among all of the agencies involved in the process. While these may appear to be related, they are in actuality quite distinct functions. These two factors will be addressed in this section.

6.3.1 Coordination Between Management Agencies

The structures devised to direct the resource management and resource claimancy procedures have varied with time. World War I efforts were run by industrial committees (under the auspices of the Council of National Defense), superseded in a few cases by temporary government agencies after a crisis forced direct intervention. World War II efforts were run by a series of "alphabet soup" temporary war agencies, some of them oriented toward a specific resource (e.g., rubber, petroleum, manpower). The overall mobilization of the Korean War period was run, for the most part, by expanded existing agencies with assistance from a few temporary agencies. No matter what structure was created, interagency conflicts, and conflicts between different programs, required coordination of agencies' efforts. World War II provides some of the clearest examples of the friction that is so much a part of the massive redirecting of the economy. Difficulties in that mobilization included disputes over the following issues:

- Requirements
- Setting priorities

- Resource claimancy and distribution
- Rationing.

During World War II, the period when the U.S. came closest to an all-out mobilization, conflicts between the military and resource managers over requirements occurred continuously. Post-war memoirs of the protagonists treat this problem at length. Civilian officials (e.g., WPB chairman Donald Nelson and WPB officials David Novick and Bruce Catton) dwell at length on their perception that the military wanted to control the mobilization. Military officials defend their actions and deny any desire to usurp civilian control.

In a generally perceptive commentary on civil-military relations, historian Louis Smith provides the clearest overview of this controversy. He summarized the military's perception:

The procurement representatives of the armed services, on the other hand, understood war administration more in terms of command than of consent. They apparently wished to have prevailing in the economy the same kind of discipline that characterized the armed services. The picture the military had in their minds of the GI in his muddy fox-hole, subsisting on K-rations and swamp water, and with sudden death everywhere around him, understandably caused them to take a dim view of coddling civilians. But this attitude frequently kept them from understanding the interdependence of the armed forces and the civilian population and led them to oppose as coddling, measures essential to the preservation of civilian morale and expanded production for war.*

*Louis Smith, op. cit., pp. 93-94.

He gave due deference to Nelson's viewpoint:

If the military group felt that Nelson did not understand the urgencies of war needs, he felt, on the other hand, that they had little real concern about civilian morale or democratic procedures, but were determined to control the war economy.*

He noted the existence of severe personality conflicts:

Nelson never measured up to the specifications of the military. Because of this, there was a steady undermining of his authority, combined with a persistent demand that he be replaced by a new administrator who would police the economy and see to it that the full demands of the armed services were met.†

He concedes that the military probably did not want to control the economy, and quotes a biography of Secretary of War Stimson to this effect:

Much of the comment on disagreement between the War Production Board and the military... was based on the assumption that the underlying issue was a contest between civilians and the military for control of the national economy. This view seemed to Stimson palpably preposterous... What they wanted for the Army was not control, but supplies, and at no time did they believe that war production could be organized under other than civilian control.§

*Ibid., p. 94.

†
Ibid.

§ Ibid., pp. 94-95

Smith's summation of the WPB-Army conflicts demonstrates the absolute need for a central, unquestioned arbiter:

Regardless of Secretary Stimson's comment, it seems proper to conclude that what the army groups desired was not merely operating autonomy, but absolute priority for their needs, unilaterally determined. When denied the full measure of their demands, they habitually sought to accomplish their objectives by other means.*

This is a logical viewpoint, and explains much of the apparent disagreement between historians on the WPB-Army conflicts. A claimant agency, especially a military agency locked in combat, would logically perceive the need to have its claims honored. Equally logically, such an agency, regardless of personalities, would have less sympathy for other claims based on somewhat "softer" foreign policy or homefront political considerations. Nevertheless, these other claims are legitimate, and must be factored into the equation. Without an arbiter with unquestioned authority, fierce political and interagency conflicts over scarce resources are inevitable and extremely difficult to resolve.

The organizational authority of the War Production Board was further disrupted by the recurring appointment of "czars," with broad, independent authority over areas where WPB also had authority. Although WPB Chairman Donald Nelson, theoretically, was superior to the commodity czars, in practice they had their independent constituencies and regarded Nelson as, in essence, "a second opinion," not necessarily conclusive. One post-war study summarized the coordinating difficulty:

*Ibid., p. 95.

Although in theory Nelson was superior to these commodity czars, whose functions largely paralleled those of WPB industry divisions, it was difficult to maintain this relationship in view of the direct responsibility of commodity czars to the President. The petroleum and rubber czardoms proved particularly difficult problems, for both the petroleum and the rubber programs were vital to over-all strategic and production programs, both were in the charge of forceful men, and both were far behind other commodity programs in the building up of plant capacity. Nelson's role was not eased by the fact that commodity czars, much like claimant agencies, had a relatively simple role vis-a-vis WPB. They fulfilled their function if they but demanded and got from WPB as much material and equipment as could be used in their own programs.*

The weaknesses of the War Production Board in establishing its final authority are vividly summarized in a series of descriptions of individual mobilization controversies, excerpted from a series of contemporary dispatches prepared by an observer in the British embassy:

- Donald Nelson and the War Production Board are going through one of the most difficult phases of their harassed career. In spite of the growing unpopularity of the various political pressure groups recently condemned both by the President and the national press, Nelson is beginning to lose ground under their concerted attack. His most formidable foe is the congressional Farm Bloc led by Senator Gillette which has long charged him with mismanaging the rubber situation by yielding to the pressure of the oil companies which are alleged to have succeeded in sabotaging various plans for the more economical production of synthetic rubber out of grain alcohol. Vice-President Wallace in an article in the New York Times of 12 July maintained that the desire to create a self-sufficient home-grown synthetic

*Civilian Production Administration, op. cit., p. 557.

rubber industry represented a political move towards a 'New Isolationism'. The answer to it was given by the easy defeat which the Farm Bloc have this week inflicted upon the Government in the Senate over this issue, by passing a bill authorizing the establishment of an independent rubber production board with the clear implication that the War Production Board has proved unfit to take charge of this matter. Nelson and the Administration leaders protested vehemently but in vain. (Nicholas, op. cit., p. 59; message of 25 July 1942)

- A showdown seems widely anticipated between the WPB and the army and navy as to who has the final say in the production of a balanced flow of material to production centres. It is rumoured that Nelson obtained a slight advantage in the shape of a memorandum conceding him better control over army and navy procurement. Criticism is widely directed at the lack of unity between strategical objectives and production requirements and it is said that arrangements will have to be made for Nelson to be much closer to military decisions which must be translated into terms of supply. (Ibid., pp. 71-2; message of 22 August 1942)
- With the addition to Jeffers and Byrnes of McNutt, Wickard and Ickes as 'Czars' of manpower, food and petroleum respectively the Administration is now approaching to the position of having a potential shadow cabinet to guide the war effort on the home front which only partly overlaps with the official cabinet.

As the 'Czars' require no senatorial confirmation and do not constitutionally function as a single body, they represent a development of the purely personal powers of the President who continues to be criticized in the press and political circles for failing to provide any regular machinery for settling their boundary disputes. No concessions have been made to the Republicans regarding representation

in this group of administrators and anti-New Deal Democrats and Republicans point out bitterly that the membership is still largely confined to old New Dealers, in spite of the admission of Messrs Nelson, Byrnes, McNutt and Jeffers to this group. (Ibid., p. 125; message of 13 December 1942)

- The feud between rubber czar Jeffers and Under-Secretary of War Patterson over the allocation of priorities for rubber and aviation petrol has emerged into full and widely deplored limelight. Nelson has given somewhat ambiguous support to Jeffers, Forrestal to Patterson. There is a general demand for the establishment of a single authority, say the popular Mr. Byrnes, who would adjudicate in such disputes before they become public property. The disputes are to be considered by Truman Committee.* (Ibid., p. 186; message of 2 May 1943)
- President's creation of a new Office of War Mobilization on 28 May headed by Byrnes...concerned with 'production, procurement, transportation, and distribution of military and civilian supplies, materials, and products,' is regarded as being of the first importance in as much as it places Byrnes in genuine control of the entire wartime economy of the country, making him in fact what he has often been called but has never been, 'Assistant President of the United States.' (Ibid., p. 198; message of 29 May 1943)
- It has been clear for over a year that the idea of a Board of Economic Warfare consisting of Cabinet members under chairmanship of Vice-President failed to do what was expected of it, to resolve inter-departmental disputes in external economic

*Riddle, Donald H., The Truman Committee (New Brunswick, Rutgers University Press, 1963), pp. 85-100, contains an informative case study of this controversy, and also describes the very positive ad hoc coordinating role this committee played, especially in the pre- and early-war years, when such authority was absent in the Executive branch.

affairs without requiring perpetual reference to President. On many occasions when substantial issues of policy have arisen, a minority of Board, usually Service Departments, have insisted on referring matter to the President. Once Byrnes had been appointed as Economic Co-ordinator, the system of BEW, which ventilated disputes which it was powerless to resolve, was bound to come to an end at some time, as it had the effect of putting on the President's desk the very type of issue that Byrnes' appointment was meant to keep from him. (Ibid., p. 220; message of 18 July 1943)

Another post-war study summarized the role the War Production Board, initially visualized as the overall mobilization coordinator, ultimately came to assume:

The upshot of the evolution of the War Production Board was that it became not so much a center of leadership and policy initiative in the Government as a point at which total resources could be determined and the limitations on what could be done defined. Within the boundaries fixed by analyses by the War Production Board it was possible for decisions to be made by the President, by the Joint Chiefs of Staff, and by negotiation among the agencies of Government. The coordinating procedures of the Board would show when it was impossible to carry out all proposed programs. Some programs had to yield and in some instances WPB determined which was to yield. In other instances the decision was made at a higher level.*

This illustrates the central organizational dilemma of our past mobilization experiences. Was WPB a "failure" because of personalities (notably, weaknesses of its director,

*U.S. Bureau of the Budget, op. cit., p. 382.

Donald Nelson)? Or was the organizational dynamic such that such conflicts were inevitable?

Our analysis of history suggests that the resource-claimant conflict is inevitable, and that the principal operating agency will also find it very difficult to set policy and settle claims. It should be noted that the controversies described previously are not the unique consequences of the World War II approach involving temporary "alphabet soup" agencies. The current organization of the government, with in-being resource and claimant agencies, contains the same dynamic. If management of programs and resources were assigned to cabinet departments, the same controversies and conflict would be likely to occur, and an operational agency modeled along the lines of the WPB would again have problems enforcing its decisions when they affect cabinet members who report directly to the President.

6.3.2 The Central Manager Concept

Major changes in the economy and the increase in government power caused by mobilization will need to be accompanied by the appointment of an individual to make final adjudication. The risk of not doing so is economic chaos (which very nearly occurred in World War I). This individual (and an appropriate support agency) must be viewed by various economic groups (industries, labor unions, etc.) as fair and impartial. Additionally, the individual must fulfill the political needs of the President and the Congress.

In World War II, one of the reasons given for the length of time President Roosevelt took in selecting someone to fulfill this role was that he needed that time to test various candidates. Through this process he determined which

men could intelligently judge between contending adversaries and would not be overwhelmed by the massive power of such a position. President Roosevelt also hesitated because he felt that constitutional problems existed with creating an "Assistant President" with great power over the economy. Although Congress initially shared this concern, they overcame their doubts more quickly, supporting broader authority for the Chairman of the WPB and, indeed, constantly agitating for better central management. However, Donald Nelson dissipated, in the opinion of some observers, large portions of this authority through delegation.* As a result, Congress was quite amenable to President Roosevelt's request to provide similar broad authority to James Byrnes as the head of OWM. President Wilson faced similar dilemmas on his way to the selection of Bernard Baruch as the head of WIB. This groping for the right individual may be inevitable. The negative consequences experienced in both wars, especially in terms of large unsolved problem areas and diversions of the President's time from overriding strategic considerations indicate that such an individual should be selected as rapidly as possible.

Despite broad-based misgivings about delegating dictatorial power, by early 1943 Congress had begun to agitate for a supreme authority to direct the economy. Donald Nelson of the WPB clearly had not succeeded in fulfilling this role and Congress was justifiably concerned. While personality conflicts, civilian/military disputes, and poor government organization contributed to the problems in organizing production and the economy, the central problem was that of coordination, of having some individual to adjudicate disputes

*Somers, Herman M., Presidential Agency-OWMR (Cambridge, MA: Harvard University Press; 1950), pp. 26-27.

in a manner that could be accepted as neutral and not self-serving, and accepted as final.*

President Roosevelt responded with a comprehensive executive order establishing the Office of War Mobilization (OWM). The authority conferred on the new office was vast. It was empowered:

- To develop programs and to establish policies for the maximum use of the nation's natural and industrial resources for military and civilian needs, for the effective use of the national manpower not in the armed forces, for the maintenance and stabilization of the civilian economy, and for the adjustment of the economy to war needs and conditions
- To unify the activities of Federal agencies and departments engaged in or concerned with production, procurement, distribution, or transportation of military or civilian supplies, materials, and products and to resolve and determine controversies between such agencies or departments, except agricultural prices, to be resolved by the Director of Economic Stabilization
- To issue such directives on policy or operations to the Federal agencies and departments as may be necessary to carry out the programs developed, the policies established, and the decisions made under this Order. It was the duty of all such agencies and Departments to execute these directives, and to report progress to the Office of War Mobilization as required.†

*Ibid., pp. 38-46.

† Executive Order 9347, 27 May 1943.

The order appeared to cover all economic mobilization functions of the executive branch. Only foreign, diplomatic, and strategic military considerations were omitted. Two months later OWM's jurisdiction was extended to the foreign economic field.*

James F. Byrnes, former head of the Office of Economic Stabilization, was appointed the first director of OWM. He immediately oriented the agency away from operational questions. He kept a very small staff on the theory that the policy job was the most important. He wanted to keep the agency free of day-to-day administrative decisions and squabbles and maintain the office's impartiality. The OWM Director was, in effect, an "assistant President" and was clearly more powerful than Cabinet members, as Bernard Baruch had advised. Byrnes' focus is made clear in the following:

Questions that the Director might be willing to delegate to his staff for settlement are not important enough for decision by the OWM as it now seems to be conceived. Questions that the Director feels he should not be burdened with personally should not burden his staff either.†

President Truman followed a similar pattern in December 1950 when, on the same day he declared a national emergency in response to Chinese intervention in Korea, he appointed Charles E. Wilson to direct the Office of Defense Mobilization (ODM). The Director was a member of the Cabinet and of the National Security Council, and had authority over

*Executive Order 9361, 15 July 1943.

†Key, V.O., "The OWM Staff Question," Intra-Office Memorandum, Bureau of the Budget, August 16, 1943, as cited in Somers, op. cit., pp. 50-51.

all aspects of the economy -- directing, controlling, and coordinating production, procurement, manpower stabilization, and transportation for the purposes of the buildup effort and economic expansion.

In all likelihood, an individual appointed to such a position will become the head of a temporary agency set up for the duration of the crisis. Several political reasons exist for this probable method:

- The Congress has generally desired a strong focus for the effort. However, the U.S. political and economic system does not provide for an "assistant President" with broad economic powers except in an emergency
- A temporary office, created "for the duration," attracts and focuses public attention much better than a sense of "business as usual"
- Existing agencies develop patterns of business and interaction that can get in the way of crisis management. An outside agent can intercede more effectively to resolve conflicts than can any of the parties to the conflict. Such an outside party can draw an aura of impartiality about the office as well
- Temporary agencies, by their nature, imply an end to the crisis at hand and a return to normal. "Temporary" expansions of existing agencies, for whatever reason, seldom get reversed, except over very long time periods.

Some proposals for organizational reform called for, in essence, a combination of the functions carried out by the War Production Board and the Office of War Mobilization, together with many other operating agencies. Somers argues persuasively that this is not an adequate substitute for an OWM-type function:

The idea has the attraction of simplicity: if you have trouble coordinating two, five, or ten agencies, just put them all in one bigger agency. But paper unification does not always achieve either unification or coordination. Carried to its ultimate extreme it returns the problem precisely where we found it. The new agency may eventually encompass most of the government; of necessity the bureaus within it become as large and influential as present departments; essentially the man at the top of the hierarchy substitutes for the President, with almost as little time and considerably less prestige...The need for the over-all coordinating job remains as real as before.*

6.3.3 Evolutionary Approach

U.S. mobilizations have always had an improvised quality about them, much to the frustration of mobilization planners. Yet, there are many reasons why an evolutionary approach may be the most appropriate. The historical experience cited earlier suggests many reasons why planners should not expect the mobilization organization to emerge in one single stage, including the unpredictability of Presidential management style, the interest group pressures and congressional decisions that will shape management and policy decisions, and the nature of the crisis itself.

There are many good reasons why the frustration of many participants, recorded at the time and after-the-fact, with the improvisational nature of the World War II period is misplaced. Especially during prewar preparations, improvising was appropriate. During the two years before World War II, President Roosevelt established a series of agencies -- the National Defense Advisory Commission, the Office of Production

*Somers, op. cit., pp. 43-44.

Management, the Supply Priorities and Allocations Board, and, after Pearl Harbor, the War Production Board. None was perfect, but each agency materially advanced the production effort. Then, at some point, each agency's very success in promoting rearmament created a new category of problem (e.g., military-civil-Allied requirements coordination and expansion/conversion policy in the case of OPM) which caused it to fail.

Establishment of an all-out mobilization program (i.e., an "M-Day" program) would have been inappropriate at any of these transition periods. Uncertainty about U.S. entry into the war and continuing opposition to the growing U.S. preparedness effort prevented this response. Nor was much more vigorous action needed. Until the defense program advanced to the point that materials shortages appeared, there was no need to manage these as-yet non-existent shortages. The criticism that can be lodged against these "transitional" agencies is not their ineffectiveness at managing current problems, but their inability to predict future problems and the need for additional controls. In other words, what was needed in early 1941 was not a "czar" to coordinate curtailment and conversion; rather, it was a planning and management agency to coordinate current activities and to develop the plans for the next stage, so that the conversion effort, when it came, would be better organized.

In the present time period, one function that may be especially important in this transitional time period is to examine the relationship between military surge plans (which may be underway) and the broader expansion/conversion programs which may be needed for mobilization. Surge does not create new resources; it consumes them. The transitional resource manager must be aware of these concerns, and assure that the resource-expansion processes of mobilization preparedness are

not deferred too long in the interests of more immediate surge responsiveness.

The changing nature of bottlenecks throughout a mobilization (discussed in Section 2.3), suggests that an evolutionary approach may be inevitable no matter what is provided in mobilization plans. Even if there were a single, umbrella management organization, the relative importance of functions within this organization would change considerably over the course of the mobilization.

Despite the turbulence of overall management organizations, another lesson of past mobilization experiences is that subordinate organizations may remain remarkably stable. Although the World War II period was characterized by constant top-level changes, the subordinate bureaus remained fairly stable in many cases. Some organizations which were established by the very first management agency, NDAC, continued to function in more or less the same fashion, carried forward through each successive reorganization from one management agency to another. Thus, the top-level turbulence masked substantial subordinate-level continuity.

6.4 MOBILIZATION MANAGEMENT ISSUES

This report suggests that the specific organizational configuration to manage mobilization is a relatively unimportant question for the resource management planner. Its configuration, authority, and leadership will be determined by factors beyond his control; to some extent, the organizational alignment will be affected by the problems that emerge and by the methods used to solve these problems. However, in determining a general approach to mobilization management, the role

of the existing structure of government is an important question to settle. Fortunately, it is not a difficult problem for the planner to settle.

In World War II, the existing government was largely by-passed in favor of temporary management agencies. Only a decade later, permanent government agencies played a much more central role. Significantly, the Korean War-equivalent of the War Production Board was established within the Department of Commerce. It is our conclusion that no compelling reason exists to prefer either model; both were successful. However, it is also our opinion that a future mobilization will inevitably be structured much more like the Korean War model than the World War II model.

National policy suggests this, by requiring that plans work through existing departments and agencies to the maximum extent possible. Moreover, these departments and agencies are a fact of life, whereas they did not exist, in any fashion approaching their present form, in World War II. Although President Roosevelt is credited with beginning the process which led to the present large, activist federal government, this permanent structure did not exist at the beginning of the World War II rearmament. Many existing resource and claimant agencies (e.g., the Departments of Energy and Transportation) did not exist at all; others were much smaller and less capable. These agencies represent a trained management resource which cannot and should not be ignored.

Even in the field of national security, the present governmental structure is much different than it was in prior mobilizations. The Department of Defense, Office of the Secretary of Defense, Organization of the Joint Chiefs of Staff,

and National Security Council did not exist at the beginning of World War II; the Bureau of the Budget had only within the previous few years begun to evolve from the relatively narrow technical role of developing the annual budget to its present responsibilities as overall coordinator of federal inter-agency and legislative policy. Even at the beginning of the Korean War, although all of the above-mentioned organizations existed, they were still in their infancy and had not assumed the central coordinating and policy function they presently fulfill. They will play a key policy-making role in any future mobilization.

Similarly, in the field of economic policy, the Council of Economic Advisors was an infant organization at the beginning of the Korean War. Assuming the Council (or some similar White House-level organization) continues to exist for the purpose of advising on and setting national economic policy, it will inevitably play a key role in establishing and reviewing mobilization economic policies.

Thus, on the organizational front, past mobilizations provide an especially poor model of specific likely organizational configurations. In all likelihood, a future mobilization management organizational chart will look very much like the federal organizational chart in effect immediately before we begin to mobilize.

This does not suggest that the government will not need to be augmented. For any large-scale mobilization, significant new personnel resources will be needed to augment existing government planning capabilities. Indeed, because of personnel cutbacks, the federal government is probably less able to handle a Vietnam-type conflict on a "business as usual" basis.

In two especially significant respects, the government is not as well postured to handle resource management as in the 1960s. First, the Business and Defense Services Administration (heir to the Korean-era National Production Authority within the Department of Commerce and now called the Office of Industrial Resources Administration) has been significantly reduced in size and is now a modest planning appendage of the Office of Trade Administration. For even a Vietnam-type conflict, this bureau would have to be upgraded significantly.

Second, the Office of Emergency Preparedness (OEP), the White House mobilization planning coordinating function, was abolished in 1973. After a series of reorganizations, this function now resides within the Federal Emergency Management Agency (FEMA), an independent agency.

The abolition of OEP caused several problems for the resource management function:

- The loss of National Security Council membership for a civilian mobilization representative
- The termination of delegate agency funding, a means used by OEP to obtain funding for mobilization preparedness and exercise control over agency preparedness budgets
- The combination of preparedness planning with several resource and claimant functions, notably disaster relief, continuity of government, and civil defense
- The loss of a dedicated, White House-level emergency preparedness function, with an accompanying loss of prestige, visibility, and central coordinating authority.*

*See U.S. Congress, Joint Committee on Defense Production, Civil Preparedness Review, Part I: Emergency Preparedness and Industrial Mobilization (Washington, Government Printing Office, 1977), pp. 10-15, for an elaboration on these problems.

This represents an organizational resource which, in all likelihood, will have to be replicated to handle any future mobilization.

As in past mobilizations, many of the new people will undoubtedly come from business. And, as in past mobilizations, there will be a need for two distinct types of individuals: senior-level business, labor, and political leaders to occupy senior policy positions; and large numbers of working-level specialists to handle operational responsibilities. The government presently maintains a National Defense Executive Reserve which, in theory at least, provides these types of personnel with training and assignments in advance, to minimize confusion at the time they are activated.

The change in the peacetime role and scope of the federal government suggests one change which may be necessary in the type of individual recruited for temporary mobilization management responsibilities. In prior mobilizations, large numbers of individuals were needed who were familiar with production and with individual industries. While this need would continue to exist, the altered role of the federal government suggests that there may also be a need for personnel who understand the federal government and who "know their way around Washington."

6.5 SUMMARY

Existing government agencies provide a framework for most of the management functions that would be performed in a national mobilization. At the resource-claimancy level, the military planning level, and the national security/economic policy level, existing agencies perform many of the functions

which were carried out, in past mobilizations, by temporary agencies. Augmentation of these agencies would undoubtedly be needed, both in terms of establishing new subordinate bureaus and recruiting new personnel. However, no substantial reorganization of existing federal government resource/claimant agencies is needed or likely.

The specific structure for resource management probably will evolve in a future crisis rather than coming into being at once. Before resource shortages require a central manager, no need will exist for establishing one. Again, the existing structure will be sufficient for arranging preliminary actions if adequate plans exist.

Once resource shortages emerge, coordination and adjudication will become more important. Priorities, allocations, requirements review, and, perhaps, curtailment and scheduling will need to be performed. The present organizational structure will surface the same types of civil-military, resource-claimant, and other types of interagency conflict seen in past mobilizations. Ultimately, a single individual with authority to settle interagency disputes will need to be appointed. This is not a decision any future president is likely to rush into and no reason exists for him to do so prematurely.

7.

CONCLUSIONS

With the renewed emphasis on industrial preparedness and responsiveness of the current era, an examination of past U.S. ventures into economic mobilization is very much in order. This report has attempted to glean that past experience for possible lessons applicable to the modern era. The report identifies guideposts that may have been forgotten or neglected during the long period since the Korean War. In an era of strategic nuclear parity, these past experiences provide an effective background for identifying the important issues in planning for conventional warfare. If the ultimate national desire is to avoid a nuclear war, then planning must consider the possibility of a long conventional conflict and the planning and policy implications of such a war in terms of the U.S. economy and resource base.

The following sections present our principal conclusions, in the general framework described in Chapter 1.

7.1 STRATEGIES

Modern U.S. foreign policy will probably not allow the nation to sit on the sidelines following the outbreak of major power warfare, as occurred in the two prior world wars. Thus, the nation must be prepared to act on ambiguous "warning" (either low-level conflict or a crisis) to begin the long process of industrial mobilization because of the unavoidable time delay involved in bringing U.S. economic power to bear.

Mobilization for limited war is a different, and perhaps more challenging, resource management problem. At least selected resource management measures would be needed for such conflicts, without the "all-out" national spirit that accompanied our prior mobilizations.

In any mobilization, resource limits will affect national strategies, as they have in the past. Even when sufficient resources are available, production delays, civilian requirements, political pressures to avoid austerity, and similar factors will restrict their availability. This will be one of the stiffest challenges faced by civilian resource managers, as the military will probably want "more sooner."

7.2 REQUIREMENTS

Several important historical lessons apply to peacetime mobilization requirements planning. First, requirements planning must be flexible. As discussed in Chapter 3, no single set of requirements can possibly cover all contingencies. (Current national planning does not even provide definitive requirements for a single contingency because Allied and civilian aspects are not properly considered.) Requirements generated in peacetime may be too high or too low, or they may just be for the wrong items. The margin of error is increased by the likelihood that end-item requirements will fluctuate even during wartime and that substitute end items, components, or materials will change requirements further.

As a result, planning based on requirements must stress capacity to meet a wide range of possible scenarios. A principal purpose of establishing planned requirements is to

provide discipline to the planning process and to facilitate identification of levels of increased production that will require austerity or other resource management measures. Requirements and capacity planning must include not only end items (dictated by the strategy and the duration and intensity of the scenario), but also components, materials, and infrastructure support (dictated by the makeup of the end items). Identifying the impact on lower-tier and support industries of possible defense production programs is a critical preparedness function; without this information, a mobilization program could founder in its earliest stages.

As discussed in Chapter 5, capacity planning must provide not only for effective utilization of currently available defense capacity, but also for conversion and expansion of capacity. For this reason, mobilization planners must approach the "surge" concept with caution. While surge planning is beneficial in the sense that it provides for rapid and selective production increases, it probably should not be viewed as the "front end" of mobilization. The surge concept is limited to current producers and production assets, and does not explicitly provide for the resource and capacity expansion needed to sustain even partial mobilizations. The risk of surge planning is that it could consume the warning time needed to prepare for mobilization without posturing the economy for these more vigorous actions. Mobilization planners need to take this factor into account when planning for preparatory actions, because the actions to prepare to mobilize will not automatically happen during surge.

Requirements plans must be flexible enough for selective or partial implementation. Vietnam and Korea are both examples of conflicts which stressed only a portion of the

production and resource base. End-item and component requirements, and the intensity of accompanying resource management programs, would be very different in a Korean scenario or a Southwest Asian scenario, to mention only two examples, as compared to a European scenario, and the resource management problem would be correspondingly different.

Finally, history shows the need to determine strategic requirements as a sum of civilian requirements, requirements for support of allies, and military requirements. Representative agencies must coordinate these requirements within the context of overall U.S. and allied military production capacity.

7.3 RESOURCE MANAGEMENT -- ALLOCATIONS AND CONTROLS

The potential range of resource management control techniques is very wide. The broad measures used in a World War II-style mobilization are fairly well documented and understood, at least by specialists. However, the U.S. economy operates under both political and economic imperatives to minimize controls. Thus, strategic requirements must be balanced by political sensitivity and economic realism. Within these constraints, priority systems work well as long as demand does not dramatically outstrip supply. When strategic requirements greatly exceed production capacity, additional allocation systems will be required.

The changing nature of bottlenecks will require different resource management emphases over the course of the mobilization. In situations that begin with limited engagements, too sharp a focus on immediate problems may result in a

loss of flexibility to deal with a larger conflict. Mobilization plans and programs must retain flexibility both during peacetime and during the mobilization itself.

The greatest challenge faced by the resource manager is to provide balance between the resource management program and the military buildup. Inadequate controls, or delays in applying them, can slow the pace of the buildup and worsen materials shortages. This can also lead to inflation and drawdowns of force readiness as preparatory actions consume resources. Controls which are viewed as excessive, on the other hand, can cause economic disruption through "priorities unemployment" and overexpansion. This, in turn, can endanger not only the resource management program itself, but possibly the nation's foreign policy consensus as well.

The problems of knowing how much control to apply and when to apply it will be compounded during the early stages of a mobilization, especially if this takes place prior to the outbreak of actual conflict. Actions in this environment will suffer from political controversies surrounding the ambiguous nature of the threat. Serious political disagreements are likely to arise because of differing perceptions of the extent of the threat, the "proper" U.S. response to that threat, and the inevitable questions regarding "destabilization" and "deterrence." The same sorts of problems will arise if industrial mobilization is undertaken, in response to a limited war, to deter or enable the nation to fight a wider war (as was seen during the Korean war period). The only response for the resource manager is to develop and have available flexible plans to meet these perceptions. As has been stressed throughout this report, flexible planning, allowing the broadest possible range of action, is critical to effective resource management. Inflexible "M-Day" plans, requiring rapid and

extensive government intervention in the economy, do not serve the need for evolutionary controls and cannot be justified except in the most extreme of circumstances. Because of the inevitable time factor involved in gearing the economy toward maximizing defense production, plans that wait until late in a crisis will be ineffective. Flexibility allows the resource manager to address and solve the most difficult problems of how much control to apply and when to apply it as the crisis unfolds.

7.4 EXPANDING DEFENSE PRODUCTION

Selectively or comprehensively increasing the levels of production by existing defense contractors may be sufficient for a relatively small "surge" requirement, but it is not a substitute for mobilization nor is it an adequate beginning to the mobilization process. In a larger view, the scale of mobilization is determined by strategic necessity rather than the capabilities of existing defense producers. For this larger requirement, the time perceived to be available and the projected level of resources needed are the joint determinants of how the resources will be obtained. Industrial expansion may be the preferred method for satisfying even large demands if adequate time is available. Industrial conversion, or a combination of expansion and conversion, may be required if time is limited. In the short run, scarcities of skilled labor, materials, and industrial plant capacity may limit mobilization, but, given time and effective plans and programs, the government can create new defense resources through expansion or conversion, or a combination of both.

The resource management planner must place a principal emphasis in peacetime on conversion and expansion

planning. If curtailment, conversion, and expansion are undertaken, funding must be provided, and plans should be developed to expedite the application of civilian resources to defense production. Cooperative peacetime planning with industry, identification of expansion requirements, and establishment of "trigger orders" and voluntary agreements can smooth the way in the initial phases of a military buildup and avoid much of the confusion and controversy experienced in the past. Resource management programs can expedite conversion by curtailing civilian production, directing contracts and resources to military producers, and expediting exchange of technical data and "know-how."

7.5 POLITICAL CONSIDERATIONS -- ORGANIZATIONS AND POLICIES

National policies can have a significant impact on resource management programs. The pace and the ultimate dimensions of a military buildup will be controlled largely by the availability of resources and by the constraints imposed on national policy.

The political aspects of mobilization are of central importance. The normal political processes associated with brokering legislation and protecting bureaucratic "turf" are intensified by increased government control over the economy. Thus, plans must be flexible enough to account for taking action in an environment that permits only limited responses and controls. Planners who attempt to assume away these problems risk having their plans brushed aside by the very political realities they have chosen to ignore.

In this context, planners should work to the maximum extent within existing legislation. Sweeping packages of proposed changes are not likely to be approved during periods of ambiguous warning and limited buildups. However, this is the very period when legislative authority is most important. In fact, actual legislation passed during the difficult transitional period may be to implement goals not directly related to mobilization, e.g., to advance social goals or to protect the environment. Even once war begins, Congress will still put its own stamp on mobilization authorities and programs.

Early contacts will need to be made with congressional leaders to explain foreign policy and resource management objectives and to arrange a method for expeditious handling of funding and legislative proposals. In prior mobilizations, although virtually every committee became involved in critiquing war programs, Congress established a single committee as a central clearinghouse -- the Truman committee in World War II and the Joint Committee on Defense Production for the Korean War. Establishment of such a committee could facilitate a future mobilization effort.

Fortunately, the current legislative basis for resource management provides broad authorities, many of which are little known and less understood. Virtually all of the resource management actions described in this report could be undertaken, to at least a limited extent, within the confines of existing legal authorities. Most of these authorities remain as an inheritance from past mobilization efforts. Unfortunately, some of these authorities have been seriously constrained in the past decade. Some of these recent amendments could reduce the effectiveness of these laws, and proposals to modify them will be a top priority during a preparedness phase.

One significant aspect of recent mobilization plans has been careful consideration of organizational structures to execute the mobilization effort. From an historical perspective, specific organizations to manage resources and handle resource claimancy efforts have been subject to the political style of the President in office, rather than the available plans. The specific organizations to handle resource claimancy and management should not be a critical consideration in creating mobilization plans. Rather, the plans should focus on the functions to be performed in the various phases of a crisis on the reasonable assumption that, whatever structural form is selected, the various functions will be performed.

One reason that organizational issues appear less important is the fact that the current federal structure is so much more diverse and capable than the structure existing in 1940, the last mobilization managed extensively by temporary agencies. At the national security policy, economic policy, policy coordination, and resource-claimant levels, numerous departments and agencies exist which did not exist in 1940. They perform many of the missions performed in World War II by temporary agencies, and it would not be logical to assume that they would be supplanted.

Thus, the organizational structure for a future mobilization would probably approach the peacetime structure -- as we saw in Korea and Vietnam, both of which, relative to World War II, were handled by the mainstream government agencies.

In two significant respects, the government's organization for resource management has deteriorated since Vietnam. First is the continuing decline of the resource manager function within the Department of Commerce. This agency, heir

to the Korean-era National Production Authority, will need to be upgraded and augmented substantially in a future mobilization.

Second is the abolition of the White House preparedness coordination function, now resident in FEMA. Such a function, either in the White House or reporting directly to the President, will be necessary in any mobilization.

A further organizational consideration of critical importance is the need for a central civilian manager. This individual's role in previous mobilizations has been as a form of "assistant President," managing the economy. Once the mobilization moves beyond "business as usual" to resource allocation, this individual is needed to adjudicate disputes and provide overall policy guidance for the effort. The central manager, most likely the head of a small temporary agency created for the duration of the crisis, must be trusted by the President and by Congress and be held in high esteem by all elements of the economy. Since the primary role will be to adjudicate claims for those resources no longer sufficient to satisfy all demands in the economy, this agency can be fully effective only if it exercises no resource claims of its own.

The organizational structure will evolve to cope with changing bottleneck and resource management problems. In the preparatory phases for mobilization, and in relatively small build-ups, it may not be necessary, or even desirable, to make major changes in the current organizational structure. As a conflict intensifies, or as resource shortages emerge, new coordinating organizations may be needed. As bottlenecks march through their normal evolution, the relative importance of the expansion/conversion planner, the machine tools or construction coordinator, the materials controller, and the

production coordinator will change, suggesting an inevitable evolution in organizations. However, the form taken by these organizations will be dictated by the scale of the emergency and by political factors beyond the planners' control. Thus, the details of many organizational concerns of great importance later in the mobilization need not be of great concern in peacetime. Time will be available to refine such plans as the mobilization pattern develops.

7.6 PEACETIME PLANNING AGENDA

Appendix D reprints a 1950 discussion of two alternate approaches to mobilization planning: the "blueprint" approach and the "problems and methods" approach. Advocates of the blueprint approach believed it was desirable to prepare precise guides to mobilization, including detailed organizational plans, standby legislation, orders and forms, and schedules. They argued that the lessons of the recent past were sufficiently clear that there was only one way to mobilize, and that time in a future emergency might not permit either trial and error or development and refinement of plans.

"Problems and methods" planners argued, on the other hand, that political uncertainties clouded the planner's vision, and that it was impossible to attain this degree of certainty about the shape of future mobilizations. They advocated planning approaches calculated to identify likely problems and options for dealing with these problems.

The experience of the 35 years since publication of the report would appear to vindicate the advocates of "problems and methods" planning. Shortly after this discussion of the issue, the U.S. partially mobilized for the Korean War,

and the organizational "blueprints" prepared earlier were discarded. Moreover, the major East-West conflict anticipated by the "blueprint" advocates did not occur, and, for much of the intervening 30 years, planning resources have not been available to provide continuing updates of such an elaborate mobilization plan.

Because peacetime mobilization planning resources are likely to remain limited, it is important for the mobilization planner to focus on those critically important elements of national resource management planning that:

- Will be especially important in the initial stages of a mobilization effort
- Are likely to be implemented regardless of the political environment or organizational structure selected to manage the effort.

Because of the importance of conversion and expansion, these plans should receive a high priority in peacetime. Critical elements of conversion or expansion planning include:

- Identifying logical conversion/expansion candidate industries and firms
- Performing, or planning for rapid performance of, plant surveys, production studies, and similar assessments of industry capabilities and bottlenecks
- Planning for early implementation of an educational order program to permit training of prospective producers, acquisition of needed equipment, and adaptation of military articles to mass production
- Establishing standby and voluntary agreements to develop assured sources of supply and to promote conversion and exchange of production information

- Development of standby financing plans and legislation for facilities expansion
- Development of curtailment and contract distribution plans, and identification of likely problems.

These conversion and expansion plans, many of which are logically a responsibility of FEMA, should be coordinated with ongoing military planning, which stresses surge planning with existing producers and conversion planning with a limited number of individual planned producers.

Planning for increased levels of resource control is another important peacetime planning mission. This planning should focus on general military and civilian requirements and identify those levels of production requirements and civilian market disruption that would require increasing the severity of resource controls. Planning for the necessary emergency modifications to existing priorities and allocations systems would be one important element of these plans. Identifying alternate resource management strategies and the levels at which more vigorous measures -- including curtailment and scheduling -- might be needed could avoid much of the confusion and disruption experienced in prior mobilizations.

Finally, attention should be directed to pre-conflict preparatory actions -- the important first steps -- which would be undertaken within existing authorities and, in all probability, by existing agencies, to prepare for a possible crisis.

APPENDIX A
SELECTED BIBLIOGRAPHY

SELECTED BIBLIOGRAPHY

Literally hundreds of books and reports have been written on our economic and production experience during periods of mobilization or about plans prepared to provide for mobilization. Exhaustive bibliographies on mobilization documents have been prepared by, among others, FEMA's Resources Planning Division and the Industrial College of the Armed Forces library.

In performing this survey, it was not TASC's intention to prepare a definitive history of war mobilization programs, or even, for that matter, a definitive history of resource management for mobilization. Rather, the intent was, within limited resources, to survey a broad range of literature to determine lessons of past mobilizations which might be relevant for present-day resource management planning. To accomplish this, we attempted to review a broad range of books and documents which could provide a general perspective on different aspects of the resource management issue during the four major conflicts of this century. In this review, we examined government planning documents and after-action reports, memoirs of participants, and books prepared after the fact by historians or other non-participants. The focus of these publications varied. Again, in keeping with our purpose of providing as diverse a survey as possible, we examined documents which concentrated principally on organizational aspects, on the quality of planning, on military procurement, on resource management, and on "homefront" issues such as political decision-making and business-labor-government relations.

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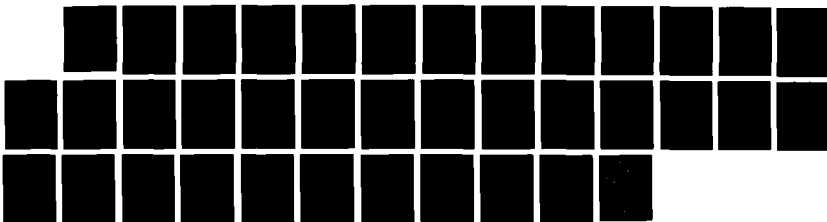
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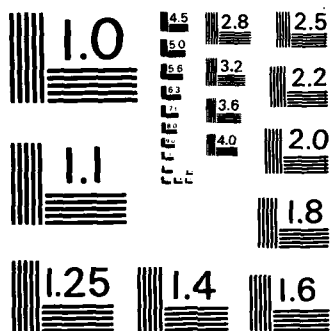
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The selective bibliography below lists some of the publications which were especially important in forming and verifying the theses presented by TASC in this report. These are not necessarily the best books prepared on these periods, nor are they the most complete. However, when reviewed in context, these publications provide a relatively complete picture of the range of experiences and points of view on our mobilization experiences.

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2. Baruch, Bernard M., American Industry in the War: A Report of the War Industries Board (New York, Prentice-Hall, 1941). An updated version of Baruch's final report on World War I resource management. Issued just prior to World War I, it also contains Baruch's 1931 testimony on mobilization planning. Provides insight into the halting development of World War I resource management programs and interwar planning controversies.
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4. Blum, Albert A., "Roosevelt, the M-Day Plans, and the Military-Industrial Complex," Military Affairs, April 1972, pp. 44-46. Describes development of the 1930s mobilization plans and the reasons for FDR's rejection of these plans.
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6. Campbell, LTG Levin H., The Industry-Ordnance Team (New York, Whittlesey House, 1946). Thorough discussion of World War II mobilization from the perspective of the Army Chief of

Ordnance. Emphasis on procurement programs and on the Army's role in resource management.

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11. Goodwin, Craufurd D., ed., Exhortation and Controls: The Search for a Wage-Price Policy, 1945-1971 (Washington, Brookings Institution, 1975). A series of papers describing the development of wage-price policies, and the political controversies about controls, since the end of World War II. Especially valuable for its description of implementation and repeal of Korean War controls.

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Study sponsored by the Council on Foreign Relations which places pre-war rearmament program in domestic and international political context.

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17. McQuaid, Kim, Big Business and Presidential Power from FDR to Reagan (New York, William Morrow and Co., 1982). History of relations between Presidential Administrations and the business establishment since the Great Depression. Extensive material on FDR's and Truman's approach to organizing for emergencies.

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APPENDIX B
STATUTORY BASIS FOR MOBILIZATION

STATUTORY BASIS FOR MOBILIZATION

As discussed in Chapter 6, existing legal authorities (i.e., those already approved by Congress, whether they are available in peacetime or only under prescribed conditions) are critically important. They are important from two perspectives:

- They provide some dimension of certainty to the planner, who can place more reliance on existing legislation than on draft legislation
- They provide a basis (and probably the only basis) for action in the early stages of a crisis, when a national consensus may not exist in support of enacting broad new mobilization authorities. Indeed, in the early stages of a crisis, circumstances may virtually make it impossible to request new mobilization authorities, due to concerns that Congress might place severe restriction on a President's flexibility.

For this reason, a review of existing legal authorities for resource management planning and actions is important. Such a review discloses that a great deal of statutory authority remains from prior mobilizations.

Because of their general adequacy, and the difficulty of obtaining broader authorities, these existing laws probably will guide any future mobilization efforts, especially in the initial preparatory stages. The following sections describe existing authorities for organization and coordination, for resource management, and for priorities, allocations, and requisitioning of capacity.

B.1 GENERAL RESOURCE MANAGEMENT AND COORDINATION
AUTHORITIES

B.1.1 The National Security Act

The National Security Act of 1947 (50 U.S.C. 401 et seq.) provides broad authority for national defense and preparedness planning. Specifically, the National Security Resources Board (now, through a long process of reorganizations, the Federal Emergency Management Agency) is authorized to develop plans and to advise the President on:

- Industrial and civilian mobilization, to make the maximum use of the nation's manpower in time of war
- The stabilization and conversion to a wartime footing of the civilian economy
- Unifying the activities of federal departments and agencies engaged in activities important to the war effort or mobilization
- Rationalizing potential supplies of and requirements for manpower, resources, and productive facilities
- Establishing adequate reserves of strategic and critical materials
- The strategic relocation of industries, services, government, and other essential economic activities.

This Act borrows many concepts from the Executive Order and legislation establishing the Office of War Mobilization. However, the Act is different in that the functions are limited to advising the President rather than exercising this authority unilaterally. This is a critical ambiguity in FEMA's charter and in federal preparedness law.

B.1.2 The Defense Production Act

The Defense Production Act of 1950 (50 U.S.C. App. 2061 et seq) provides a broad range of authority applicable to conversion or expansion planning. These include:

- Authorization of funds (subject to appropriation) for financial assistance to expand productive capacity and supply (Sections 301-304)
- Authority to delegate DPA authorities, to establish new agencies to carry out DPA policies, and to issue regulations to implement, enforce, or grant exemptions from DPA procedures (Sections 703-704)
- Authority to obtain information to carry out the purposes of the Act (Section 705)
- Authority to establish "voluntary agreements" with industry to "help provide for the defense of the United States through the development of preparedness programs and the expansion of productive capacity and supply" (Section 708)
- Authority to establish a National Defense Executive Reserve, and to assign and train these individuals for wartime resource management missions (Section 710).

The DPA establishes program responsibility for most of the key mobilization and resource management programs. It provides for the principal "housekeeping" functions (permitting establishment of new agencies; regularizing procedures for recruiting temporary employees and training them in advance; and establishing authority for statistical programs). Substantive program authorities include two critical authorities for expansion and conversion: authority to provide financial assistance and authority to waive the antitrust laws (although

both of these authorities are severely constrained). Although the existence of these authorities provides important assurances to the resource management planner, both will need to be reconsidered for effective management of mobilization programs.

B.1.3 The National Defense Act

The National Defense Act of 1916 (10 U.S.C. 4501 et seq. and 10 U.S.C. 9501 et seq.) authorizes the Secretaries of the Army and Air Force to:

- Maintain a list of all privately owned plants in the U.S. equipped to manufacture arms, ammunition, or parts, and to obtain complete information as to potential products and the equipment and capacity of each such plant
- Maintain a list of privately owned plants that could be converted to manufacturing for the Army or Air Force, to obtain complete information as to the equipment in each such plant, and to prepare comprehensive plans for converting each such plant to arms manufacturing
- Obtain "gauges, dies, jigs, tools, fixtures, and other special aids and appliances, and specifications and drawings" necessary for manufacturing arms, ammunition, or equipment.

The National Defense Act also authorizes the President to appoint a Board on Mobilization of Industries Essential for Military Preparedness.

B.1.4 The Army Appropriations Act

The Army Appropriations Act of 1916 contained permanent provisions (50 U.S.C. 1 et seq.) authorizing the establishment of a Council of National Defense (consisting of the

Secretaries of the Army, Navy, Interior, Agriculture, Commerce, and Labor), and authorizing the Council to establish an Advisory Commission.*

The Council is responsible for "coordination of industries and resources for the national security and welfare." Specific responsibilities include making surveys and recommendations to the President on:

- Location of railroads to permit "expeditious concentration of troops and supplies" and development and utilization of waterways and seagoing transportation
- Coordination of "military, industrial and commercial purposes"
- Mobilization of industrial resources
- Methods of increasing and sustaining production for wartime, especially "during the interruption of foreign commerce."

The Council is also empowered to transmit information to industry on the types of supplies needed, and requirements for these supplies, during wartime and to establish relations with industry to expedite increased production for mobilization.

B.1.5 The Defense Industrial Reserve Act

The Defense Industrial Reserve Act (50 U.S.C. 451 et seq.) provides for establishment of a defense industrial reserve, "an essential nucleus of Government-owned industrial plants and an industrial reserve of machine tools and other

*President Roosevelt used this authority to establish the National Defense Advisory Commission (NDAC) in 1940, the first of several temporary mobilization management entities.

industrial manufacturing equipment ... to supply the needs of the Armed Forces in time of national emergency or in anticipation thereof." The Act's statement of national policy to favor private over government ownership is a critical legislative barrier to a government-funded expansion strategy.

B.1.6 Specialized Resource Management Statutes

There are a host of federal statutes which apply to specific resources, such as energy, transportation, and materials. These statutes can have an important influence on resource management plans and programs. This report can only touch the surface of these broad authorities. Some of the more significant include:

- The Energy Policy and Conservation Act (PL 94-163), which establishes the National Strategic Petroleum Reserve (42 U.S.C. 6201 et seq.) and establishes separate energy priorities and allocation authority, under the aegis of and to be coordinated with the national defense priorities and allocations system under the Defense Production Act of 1950 (50 U.S.C. App. 2061(c))
- Energy Security Act of 1980 (PL 96-294), which establishes funding for the Synthetic Fuels Corporation to develop domestic synthetic fuels production capability
- Naval Petroleum Reserve Act (10 U.S.C. 7421 et seq.), which establishes the naval petroleum and oil shale reserves and authorizes the Navy to seize or acquire transportation pipelines to transport the petroleum
- Act of August 29, 1916 (10 U.S.C. 4742), which authorizes the Secretary of the Army, in time of war, to take possession or assume control of any transportation system for transportation of troops, material, or any other purpose related to the emergency.

The Act permits the Secretary to use these systems in preference to any other transportation requirements

- Mining and Minerals Policy Act of 1970 (30 U.S.C. 21a) and National Materials and Minerals Policy, Research and Development Act of 1980 (30 U.S.C. 1601 et seq.), which establish national policy to encourage exploration and development of mining resources and require the President to identify materials needs and make them available for, inter alia, national security purposes
- The Strategic and Critical Materials Stock Piling Act (50 U.S.C. 98 et seq.), which requires the President to identify material needs and take steps to assure their availability for national security, to assess federal policies affecting minerals and materials availability, and to establish the National Defense Stockpile.

This section can only suggest the scope of existing law permitting implementation of resource management programs. The federal statutes regarding preparedness are indeed a patchwork quilt, enacted unsystematically over a long period of time. Undoubtedly, other authorities applicable to resource management programs can be found in federal law; additional statutes may also constrain the use of these authorities.

Nevertheless, even the preliminary survey undertaken for this report suggests that there is a broad range of general authorities which can be creatively applied to solve resource management problems. The next section considers one especially important subset of these authorities -- statutes authorizing priorities, allocations, or requisitioning.

B.2 AUTHORITIES FOR PRIORITIES, ALLOCATION, AND REQUISITIONING

No fewer than four laws provide authority under some circumstances to order priority for the military in production. Some of these laws also provide allocation authority or authority to requisition or seize production facilities refusing to give priority to military orders.

B.2.1 Defense Production Act Priorities Authority

The most important priority contract performance authority is found in the Defense Production Act of 1950 (50 U.S.C. App. 2061), which authorizes the President "to require that performance under contracts or orders (other than contracts of employment) which he deems necessary or appropriate to promote the national defense shall take priority over performance under any other contract or order, and, for the purpose of assuring such priority, to require acceptance and performance of such contracts or orders in preference to other contracts or orders by any person he finds to be capable of their performance." In addition, the DPA permits him "to allocate materials and facilities in such manner, upon such conditions, and to such extent as he shall deem necessary or appropriate to promote the national defense." However, there are some restrictions on allocation of materials within the civilian market. The Act also establishes a separate, and somewhat more cumbersome, energy priorities and allocation authority, and prohibits use of DPA authorities for consumer gasoline rationing. These authorities provide the basis for the present Defense Priorities and Allocations System (DPAS).

B.2.2 Other Priorities Authority

Other priority performance or plant requisitioning authorities are contained in:

- The National Defense Act of 1916 (10 U.S.C. 4501 and 9501), which authorizes the President "in time of war or when war is imminent" to: (1) place priority orders for "necessary products or materials of the type usually produced or capable of being produced" by the recipient; (2) take possession of any plant whose owner refuses to accept or give preference to a priority order, if that plant is "equipped to manufacture or capable of being readily transformed" to manufacture "arms or ammunition, parts thereof, or necessary supplies," for the Army or Air Force; and, (3) operate any such plant seized for that purpose
- Act of March 4, 1917 (50 U.S.C. 82), which provides similar priority performance and plant seizure authority, in time of war, for production of "such ships or war materiel as the necessities of the Government ... may require;" it also authorizes requisitioning and operation of any factory
- Selective Service Act of 1948 (50 U.S.C. App. 468), which authorizes, whenever in the interest of national security, placement of priority orders for "articles or materials ... exclusively for the use of the armed forces ... or for the use of the Atomic Energy Commission" with "any person operating a plant, mine or other facility capable of producing such articles or materials;" requires that a "fair share" of such orders be placed with small business; and authorizes government seizure and operation of any such facility refusing to accept or give priority to such orders.

These somewhat redundant laws provide broad authority, especially during wartime when the first two become available, and provide a considerable supplement to the more-commonly-known DPA authorities. While the DPA undoubtedly contains more than sufficient authority for peacetime, use of these additional authorities during war or emergencies should be considered by resource management planners.

B.3 GENERAL EVALUATION

General legal authorities for wartime resource management are probably adequate, at least for peacetime planning and for initial preparatory actions at the beginning of a crisis. Existing law provides virtually unlimited authority to orchestrate production and assure priority for defense production requirements. This is the preliminary foundation for the broad spectrum of actions needed to manage the economy. Virtually all of the important resource management actions described in this report could be undertaken within the scope of current authorities.

Rather than the absence of authority, the problem in most cases is the constrained way the authorities are granted. For instance, the DPA provisions permitting financial assistance and waiver of antitrust laws have been severely restricted by Congress since the end of the Korean War. Present authorities require:

- Authorization and appropriation of funds for DPA programs to expand productive capacity and supply (in lieu of the borrowing authority established for original DPA programs)

- Stringent findings of need, repeated reviews by the Attorney General, and extensive disclosure of activities under voluntary agreements, instead of a streamlined approval process specified in the original DPA.

Because of the general wealth of resource management legal authorities, resource management planners should probably focus their attention on specific, identifiable problem areas such as those enumerated above, rather than developing grandiose, omnibus "war powers" statutes. TASC's legal review suggests there are few, if any, "war stoppers" in the resource management statutes. Thus, a narrowly-focused approach, making well-justified arguments to amend specific laws, would appear appropriate. Except in the related field of economic stabilization -- where standby or standing authorities have recently been allowed to lapse -- the legislative environment is probably sufficient to allow planners to develop their strategies with considerable confidence.

APPENDIX C
EXTRACTS FROM 1950 REPORT ON
CRITICAL MOBILIZATION PLANNING ISSUES

EXTRACTS FROM 1950 REPORT ON
CRITICAL MOBILIZATION PLANNING ISSUES

In 1950, a report by the Legislative Reference Service discussed two differing approaches to mobilization planning, the "Blueprint" versus "Problems and Methods Planning" approaches.* Because of its importance for the peacetime resource management planner, this discussion is reprinted in this appendix.

C.1 "BLUEPRINT" VERSUS "PROBLEM AND METHODS PLANNING"
 APPROACH

The two most controversial approaches to the actual methods and content of mobilization planning are the so-called "blueprint" approach and the so-called "problem and methods planning" approach.

Those who take up the cudgels for the "blueprint" idea usually refer to three things -- a set of organizational signals for running a war administration; a handbook of draft legislation on which to operate a war economy; and a book of control orders and forms to be issued to industry and labor push-button style by the war production authorities. In other words, the "blueprint" attempts to indicate exactly who does what and where the morning after...

On the other hand, those who advocate the "problem and methods planning" approach mean, in simple terms, an identification of problems and the analysis of alternative solutions, reduced to a minimum of those estimated to be

*Legislative Reference Service, U.S. Congress, Mobilization Planning and the National Security (1950-1960) - Problems and Issues (Government Printing Office, Washington, D.C., 1950, pp. 53-55.

feasible of execution, the most appropriate could readily be selected to fit the need, the time, and the circumstance...

C.2 ARGUMENTS FOR THE "BLUEPRINT" APPROACH

Arguments for the "blueprint" approach are most closely related to judgments about the imminence of a war. It is observed that with two major wars in one generation even the rapid march of technology could not render useless the knowledge and experience in war mobilization for a third engagement in that same lifetime. We know in particular, as well as in general, that we would have to allocate scarce materials and facilities for war production, maintain essential civilian consumption, stabilize wages, prices, profits, divide manpower resources between military and civilian pools, and the like. Those are things that have to be done. In a big sense, there are no alternatives about them. Alternatives in the smaller sense are intellectually engaging, but judgments made now about one alternative, given so much recent experience, could not be too different from judgments made several years from now -- at least not different in basic direction, but only in unimportant details.

Moreover, even a "blueprint" can be periodically overhauled if it is not called into use, so that it would always be as current as the necessity impelled. Furthermore, it is said a whole nation could be guided more intelligently and more consistently over the years on the basis of a known "blueprint" than on the basis of unknown "methods alternatives."

The fact that such a "blueprint" approach was made between World Wars I and II and was not used, does not mean that the "blueprint" idea as such was wrong; it simply means that the temperament of the person to whom it was committed for use was not receptive to this particular print. Even though it was not used, it is believed by many that the country could have mobilized for war quite effectively with it, and although rejected, the "plan" undoubtedly had definite influence in shaping the substituted plans. In fact appendix I on the history of the previous war mobilizations of the economy (World Wars I and II) shows that through the mobilization plan's effect on the War Resources Board of 1939 the whole outline of the War Production Board development was sketched out. An idea should not be discredited because it was rejected at a particular time in history. Perhaps the other idea -- "the methods planning" idea -- might also have been rejected at that time had it been available for choice.

A war plans blueprint ready for immediate use was prepared by the British Committee of Imperial Defense as early

as the outbreak of World War I and has been revised to date ever since. This type of plan was ready and used in both world wars.

C.3 ARGUMENTS FOR THE "PROBLEM AND METHODS PLANNING" APPROACH

The other approach...plans the identification of alternate policies, programs, and methods for meeting a war emergency on the economic front. It is urged that this method is itself substantively more important than the actual selection of the alternative to be used. Furthermore, the realistic testing of the alternatives once they are identified, constitute far more of a security protection than an untested blueprint. All decisions do not need to be made in advance. Indeed, to make them in advance creates unnecessary controversy, dispersion of energies, and may lead to the acceptance of basically unsatisfactory compromises.

In the interest of flexibility in planning, it is argued that actual decisions made in peace may well be discarded in war simply because they were made in peace and are, therefore, suspect on grounds of just not suiting political and unforeseeable personal factors in the actual conditions under which a war might have to be fought.

An illustration of this very point is to be found in the case of the Industrial Mobilization Plan of 1939 which was criticized for failing to anticipate political conditions accurately.

The plan...was a document...formulated for conditions unlike those which actually arose. It presumed the existence of a state of war under which almost any power could be had from Congress for the asking and under which a full-fledged war organization would have to be created. Neither of these conditions prevailed, and until the war came, progress could be made only as public opinion crystallized into decision.*

C.4 CURRENT STATUS OF THE "BLUEPRINT"- "PROBLEM APPROACH" CONTROVERSY

The "blueprint" and the "problem and methods planning" techniques are not mutually exclusive on all counts. Indeed,

*Bureau of the Budget, U.S. at War, Washington, D.C., Government Printing Office, 1946, p. 23.

at the end of the "problem and methods planning" program, if time permits, there will of necessity be not just one "blueprint" but a series of "blueprints." The "methods planning" technique is advocated as a slower, surer, more realistic way of arriving at a "blueprint" that is thoroughly tested for economic, military, and political feasibility. On the other hand, even if the time period for working out the "problems and methods" were to be foreshortened, exactly the same technique would have to be used in any event, though refinements would probably not be possible. In a pinch some answer is better than no answer available because a perfected one has not been thought out or completely tested.

The prevailing national philosophy as exemplified in the current NSRB and Munitions Board mobilization planning is geared to the "problem and methods planning" approach. It is set forth clearly in NSRB Document 116, July 20, 1949:

Realistic mobilization planning for war must be approached through the analysis of problems and issues rather than through the mere drafting of "blueprints." The blueprint approach gives primary emphasis to the preparation of detailed plans of operations, including drafts of executive orders, organization charts, regulations, instructions, and other administrative documents for directing the Nation's war-time activities. The problem approach seeks through analytical techniques, to identify problems, to separate their components, and to develop alternative solutions in order that appropriate executive decisions can be made in light of the circumstances at the time the decisions are needed.

The problem approach to mobilization planning does not imply that drafts of orders, regulations, and organization charts should not flow from the planning process. The analyses developed might include revised drafts of regulations used in the past war; but they would be placed within the framework of an analysis of the conditions under which they emerged, the difficulties encountered, and the problems that may be encountered in a future war or transition to war. The problem approach recognizes the fact that "a mobilization plan" comprised almost solely of administrative directives and charts would be of limited value in an actual war situation. On the other hand, "problem-analysis documents" will

facilitate intelligent action and will expedite the drafting of regulations and directives.

Planning for war does not require that all wartime decisions or determinations be made in advance. With respect to controversial areas, at least, the approach should be rather to identify the critical problems, to suggest alternative solutions, and to indicate the merits and limitations of each alternative. Pushing for specific decisions in advance of need unnecessarily promotes controversy and may lead to undesirable compromise in the planning product. In any case, there is no certainty that wartime executives will accept peacetime decisions, or that present executives will not subsequently change their views regarding peacetime decisions. In short, planning should provide the basis for resolving issues rather than attempt to provide the final answers in advance.

But the advantage of somewhat detailed answers, such as those now being sent in on request from all Government agencies to the National Security Resources Board for its own master planning, is that most of the reasonable alternatives will have been explored. The Industrial College of the Armed Forces has made exhaustive studies of all phases of economic mobilizations. These have been further supplemented by Munitions Board studies appropriate to its functions. Nearly every agency has some war mobilization responsibility or interest which bears on segments of economic planning for war. The danger is not from lack of planning, but from perhaps a lack of a sufficiently detailed set of alternative plans to fit differing levels of need or catastrophe, which an operating war agency called on to function in a crisis, might use as the basis for immediate action.

APPENDIX D
EXTRACTS FROM ANNEX 82 TO
THE 1947 MOBILIZATION PLAN

EXTRACTS FROM ANNEX 82 TO THE 1947 MOBILIZATION PLAN

The 1947 mobilization plan contained a number of assumptions of potential value to present-day resource management planners. Many of the critical issues identified in this document would also be critical today. Especially illuminating is the plan's recognition of a possible transitional stage between peace and war, a period of rising tension when the United States might be able to accelerate peacetime preparedness activities. Although the plan advocated the "blueprint" planning method it noted that this approach would become steadily less viable with the passage of time, as changes in the government and the economy altered the applicability of recent "lessons learned."

The following sections contain verbatim extracts of portions of this document.

D.1 PREPARATORY ACTIVITY NECESSARY IN PEACETIME

It is of the utmost importance for the purpose of an effective Industrial Mobilization Plan that a number of activities be initiated at once and carried on continuously prior to the development of an emergency. These planning activities fall into several different categories which are set out below. Their scope requires the participation of both civilian and military groups within the Government and leaders of affected groups outside the Government in order to assure their adequacy and bring about widespread understanding and acceptance. Performance of the functions stated below is recommended to achieve these objectives.

1. The regular and frequent preparation of a functional plan for national mobilization which takes into account

the prevailing national and international economic, political, and military conditions. An important part of this functional planning should be the encouragement of planning within the regular peacetime departments of Government to meet the problems of an emergency. Centralized information as to the organizational planning of the several departments and agencies of Government should be maintained within the National Security Resources Board.

2. The compilation of a war program including munitions, war-supporting, essential civilian and export needs, and the basic resources needed to meet them. Against these requirements should be measured the projected availability of resources and plans developed for effecting a balance. Any such trial balance will be extremely tentative and rough; all estimates and calculations must be revised continuously in the light of changing conditions and prospects. Although any such set of plans and resulting balance sheets of resources will surely not fit accurately the conditions of an actual war emergency, the knowledge gained through the process of making such approximations and analyzing their industrial mobilization implications will save invaluable time if an emergency should, in fact, arise.

3. Initial concentration on the development of general procedures and the review, testing, and improvement of methods employed by the war agencies during World War II. This function, if based on an up-to-date analysis of the principal issues which will confront each agency, will be at least as important as organizational planning. National mobilization agencies will need this tremendous head start; they are not likely to have a long period for uncertainty and fumbling such as occurred in the early years of the defense program and the past war. Planning in this area should include:

a. Development in cooperation with the Munitions Board and other Government agencies of improved methods of determining requirements for end items and of translating them into requirements for resources. Effective methods of arriving at estimates will prove at least as valuable if an emergency arises as any set of advance quantitative estimates themselves.

b. Revision and improvement of the techniques of control such as priority, allocation and scheduling devices, and preparation of definite methods for organizing wartime procurement, production, and distribution.

c. Planning with the procurement agencies methods for the most effective distribution of war contracts and sub-contracts, in order to make the optimum use of existing

facilities including small plants, and with due regard for war-supporting and essential civilian as well as munitions programs.

d. Development of internal procedures for administration and operation of war agencies. These should include procedures to cover operational activities of war agencies both in Washington and in the field; personnel procedures by which the agencies can expand as rapidly as necessary but without competition; budget procedures under which adequate operating funds may be quickly allotted; and procedures for all the numerous office services necessary to smooth internal operations. These are details frequently overlooked but particularly essential to the early effectiveness of the organizations.

4. Vital to the success of a war agency is the possession of the authority necessary to carry out the required policies. To this end, the peacetime planning agencies should draft and discuss with Congressional leaders legislation needed to deal with such problems as:

a. Provision of basic war mobilization powers including priorities, allocations, requisitioning, price and wage control, manpower control, and foreign trade control.

b. Minimizing special risks of war production which may discourage the full mobilization of industry or labor.

c. The wartime antitrust laws.

Any proposal for a legislative program to increase and direct production must recognize the basic relationships between all segments of the economy. Related measures must be adopted -- and put into effect -- together.

5. The National Security Resources Board should be the center for statistical information essential to national mobilization. This does not mean that it should be itself a large statistical organization, but rather that it should (a) maintain continuously lists of statistical series data on major potential war production facilities, and other information important for national mobilization; (b) maintain lists of the sources within the government and elsewhere for such information; (c) encourage the preparation and maintenance of such information and (d) where this is not feasible, have ready plans for securing such information in the event of the development of an emergency.

6. The agency should maintain a relatively small but highly selective list of key industrial, professional, and technical personnel who would form the nucleus of the war

agencies. It is possible that this group might be managed in a sense as a Reserve Corps, spending a week or two each year with the organization to participate in and become familiar with the planning process. Government agencies should be combed for those whose experience and training can be of most value to the war agencies and provision made for their rapid transfer when an emergency is declared.

7. The agency should establish and consult frequently with advisory committees drawn from appropriate segments of the public to deal with all the important aspects of the mobilization program.

8. The peacetime planning agency should operate largely through the several departments of the Government. Many of these departments can relate industrial mobilization planning to their normal operations. For example, studies by the Department of Commerce of industrial capacity and studies by the Department of Labor of requirements for particular skills can serve both peacetime need and emergency planning. Provision should be made for the use by the planning agency of plant and company data collected by agencies such as the Census Bureau and the Bureau of Mines, with suitable safeguards against improper disclosure.

The Departments of Air Force, War, and Navy, of course, have the most important role to play, since they are prime claimants for and users of resources in wartime, and the munitions programs are the mainspring of the entire industrial mobilization process.

D.2 PRE-EMERGENCY PHASE

One of the basic assumptions on which the Industrial Mobilization Plan of 1947 is built is that the United States will be an early belligerent in any future major war; there will not be a long period available for gradual mobilization while allies carry the burden of combat. Planning for mobilization must cover both the contingency of a sudden attack on the United States with an instantaneous transition from peace to war and also the possibility of a period marked by a rapid and serious deterioration of international relations during which important preliminary measures of mobilization could be taken although the full war powers would not be in effect. In the latter event, the pre-emergency period could be extremely important in laying the necessary last minute plans and taking the necessary steps to activate the agencies with the least possible delay when war is declared.

During this phase, final recruitment plans for top personnel should be made. Persons whose names are on the list of key civilians should be alerted; functions should be assigned and those men needed first should actually be brought into service. Small operating and administrative staffs should be assembled for each war agency to be trained in every detail of the mobilization plans. Final plans for the rapid recruitment of other personnel should be made. Contracts for office space, telephone service, equipment and supplies should be worked out.

The approximations of war requirements and resources made in peacetime should be refined and restated on a realistic basis. Broad policies governing the over-all size of the war effort should be determined. In the light of these considerations, every phase of the industrial mobilization plan should be critically examined and retested for its feasibility. Necessary expansion of facilities should be initiated; standby facilities should be made ready; military procurement methods should be placed on a wartime footing and the actual placing of contracts should be intensified.

D.3 WAR PHASE

The President must have broad powers to establish war agencies to supplant the peacetime planning agency once war has been declared. A proposed Executive order establishing the Office of War Production is included in Part IV of this Annex. After the Executive order is signed, the speed with which a war agency becomes an effective operating organization will depend on the realism with which the mobilization planners have visualized the problems to be faced by the agency and the thoroughness of the plans made and steps taken in advance.

When the Office of War Production [OWP] is first created by separation of a nuclear staff from the National Security Resources Board or the Office of National Mobilization,* additional key personnel must be recruited at once to supplement the group already enrolled and trained in industrial mobilization. All parts of the organization of OWP, both in Washington and in the field, should be manned on a skeletal basis, and the appropriate units expanded as dictated by the developing needs of the production program. In this way, the ultimate full scale pattern of organization as described in Part V can

*Note: As discussed in Section 6.2.3, President Truman rejected this assumption that the NSRB would be the nucleus for a wartime management agency.

be achieved smoothly and without the disrupting effects of successive major reorganizations. Skeletal organizations for field offices made up of selected top personnel must be established and must immediately direct their attention to the collection of data necessary for their first major assignment of contract distribution. The few key members assigned to the planning staff in Washington and in the field will be responsible for the development of over-all rules and regulations, policies, and broad programs as bases for the operation of the control systems as the emergency develops.

The staff offices responsible for program implementation, procedures, and processing instructions must be expanded for decentralized operations to insure prompt and uniform notification to field offices of activities in Washington. As the emergency develops, basic materials and commodities controls will be published and personnel for the field offices will be rapidly recruited to give all possible aid in contract distribution activities and in the assignment of priorities ratings. Every effort should be made to utilize the field offices as the effective contacts with local industry and its operations.

The organizational and functional plans proposed in this Annex are intended to be flexible, and only to indicate the direction the Office of War Production should take as it expands. Timing of the expansion and the specific emphasis to be placed on various parts of the organization will always be conditioned by events -- military, economic, and political, and by the personalities involved in the development of operations.

Finally, it cannot be stressed too strongly that the success attained in developing an organization for the most effective control of industry in wartime will be largely dependent upon the vision of planning staffs in developing not only the organizational and functional plans of a production control agency but also in providing ways of implementing those plans on the foundation laid in peacetime.

D.4 ADMINISTRATIVE PLANNING AND THE WAR PRODUCTION PROGRAM

In general, an administrative organization can be well planned only in terms of the specific job it is expected to do. In the field of industrial mobilization this means building the plans for the Office of War Production so that they will be adaptable, when an emergency arises, to a war production program which will be based on specific requirements for munitions by time periods, geared in turn to plans for the mobilization of military manpower and to the war strategy.

This first postwar Office of War Production Annex is not confined to specific substantive quantitative plans of this type, but the proposals are based on certain broad assumptions arising out of the experience in World War II and the expected general industrial picture over the next few years. Owing to our closeness to the last war, the general pattern of production controls which would be needed to achieve full-scale industrial mobilization during the next few years is clear enough to permit tentative planning of an administrative organization to guide that task. This will become less true with the passing of each year since the ending of the war. All future revisions of the Annex, therefore, must be directly related to anticipated changes in a substantive war production program.

The character, size, and timing of the war production program will determine the content of the industrial mobilization job and mold the shape of the organization which must promote, guide, and control that job. In fact, if the program calls for a total mobilization effort, the size of the industrial potential and the speed with which it can be mobilized will affect the strategic plans and the military manpower mobilization plans themselves. On the timing of requirements peaks depends one of the most fundamental features of the production program: whether all resources are to be focused immediately on the output of direct munitions or whether some of them should be used during the early phases of the war effort to build additional facilities so that even higher munitions output may be possible in the latter phases. Thus, during 1942 many thousands of tons of steel and other critical materials were diverted from immediate productive use to the construction of additional steel capacity, a program which cut the end-output of munitions during that year but was vital to the achievement of the peak production rates of 1943 and 1944.

The pattern of controls and the particular bottleneck situations which will arise are likewise the result of the specific munitions requirements. For example, the extent of required new construction will determine the necessary controls over ordinary construction and the requirements of war housing and community facilities. The location of munitions production, as well as its scale and tempo, will largely fix industrial manpower requirements and the relations between production and manpower controls. The importance of new-type weapons and the adequacy of existing facilities to produce them will determine the necessary program for new machine tools and industrial equipment. The presence or absence of a major shipbuilding program will substantially affect the industrial controls and the necessary organization to administer them. The pace and scale of conversion of facilities

and measures for the diversion and conservation of materials will depend on the production program.

No plan can encompass all such substantive programs; this initial Office of War Production Annex attempts to outline the functions and the organization which will be best suited to over-all mobilization so that demands may be anticipated and met in time. Even with the best possible substantive planning, organizational and administrative plans must be kept flexible and ready for adaptation to the actual needs of war and to the specific available operating personnel, both of which are inevitably unforeseeable.

D.5 ASSUMPTIONS AND PREMISES BASIC TO THIS ANNEX

D.5.1 Nature of the Emergency

The organization proposed in this Annex is designed to meet the needs of a major war which would require the complete mobilization of America's industrial resources. Unlike the conditions of 1914-17 and 1940-41, it is assumed that a major war within the next 5 years would find the United States among the initial belligerents. We could not depend again upon a substantial period of time in which to build up our industrial potential or to initiate industrial mobilization through the supply of munitions to other belligerents.

On the assumption of full-scale and rapid industrial mobilization, materials, manpower, and other resources would have to be shifted into war production much more quickly than in the period 1940-43. Moreover, the plan must provide for the possibility of even more complete mobilization of industry than was reached at the peak of the last war. Except for the metal-using industries (particularly automobiles, other consumers' durable goods, and construction), the curtailment of production for civilian use in the interest of war output was moderate. Only toward the end did curtailment become serious in lumber, textiles, leather, and other similar lines. While civilian curtailment would not be sought for its own sake, an "all-out" war effort of long duration would undoubtedly involve even tighter controls and a more drastic restriction of production on civilian account.

In full-scale mobilization, the paramount objective must be the maximum concentration of the Nation's available resources on war needs. This means not only direct munitions, but also the needs of the basic war supporting industries such as transportation, petroleum, and power; the wherewithal to maintain the flow of raw materials and components; essential exports to our allies; and the minimum civilian supplies

required to keep the war economy functioning efficiently. In total war, all legitimate requirements are war requirements, although not all are of the same urgency. The wide margins of safety which are normally provided in our industrial operations through ample reserves of resources cannot be afforded in total war; they must be scaled down everywhere -- in the general civilian sector, in the basic war supporting industries, in exports, and in the direct military munitions programs. The relative urgency of all types of war requirements, direct and indirect, will require constant review and modification as the war progresses.

With these margins pared to the bone, the organization must be able to direct resources promptly to the points most needed by the war effort. By its very nature, a war program involves some unpredictable requirements, and emergencies will be numerous and frequent; the production agency must be prepared to meet such unforeseeable but vital needs without delay. These conditions do not permit protracted conflict among the various war agencies. There must be the closest collaboration in the determination and review of direct and indirect war requirements and in the administration of controls over industrial production, manpower, transportation, fuels, agriculture, and economic stabilization.

D.5.2 Atomic Energy and Other New Weapons

It is assumed that the availability of atomic weapons, rockets, and other new weapons would not obviate the necessity for full-scale industrial mobilization. In other words, it must be assumed that a war within the next 5 years would not be a "push button" affair, lasting only a few weeks and resolved one way or the other entirely on the basis of stocks of weapons existing at the start. As the basic science and technology of warfare develop, the character of the industrial problem will change, and mobilization plans must, of course, be modified accordingly.

D.5.3 High Levels of Production

The outbreak of a war emergency during the next 5 years would probably find us in a state of high-level production. There would be no large reservoir of unemployed facilities in the basic industries or of unemployed manpower comparable to that of 1940. A rapid expansion of munitions production would therefore require the immediate diversion of resources from civilian into war-production channels and the most rapid conversion of industrial facilities to war use. It would be impossible to pursue the "guns and butter" policy of the pre-Pearl Harbor period. The very rapid probable required increase in the production of specialized munitions

not available in existing stocks, particularly new types of munitions, would require substantial tooling.

The Nation would therefore be faced immediately with a number of "must" programs like those which constituted the chief war-production problems of 1944 and early 1945. At the same time, general munitions production would have to be expanded rapidly in order to bring current production up to requirements as existing stocks were depleted. If our military force is to be exerted over great distances, the exceedingly large "pipe line" requirements would accentuate this latter need. Under these conditions, moreover, substantial new shipbuilding would probably be required.

D.5.4 High Employment

The defense program of 1940 began during a period of heavy unemployment. As a result, while there were a few early manpower bottlenecks in particular places or in the supply of labor with particular skills, the over-all supply of manpower did not become a serious problem until late 1943. Under the assumption of high levels of production stated above, there would be no such reservoir of unemployed at the outset of another war emergency. Along with the prompt conversion of industrial facilities and diversion of raw materials and components from civilian to war production, therefore, there would be needed a large-scale and prompt conversion of manpower. This would take place partly in the same plants, but much of it would also involve movement into specialized war plants and into the expanded supply of special war materials. Considerable migration might also be necessary.

Nonetheless, if the incentives and controls for the shifting of manpower into war production are adequate, the over-all manpower supply should not be a limiting factor on the war effort during the first year or two. The total labor market can be expanded promptly by the addition of several millions of persons not seeking employment in peacetime, while the rate of withdrawal of personnel into the armed forces is limited by the availability of training facilities. Moreover, the introduction of a longer workweek (say from 40 to 48 hours) would immediately add about 20 percent to effective manhours of work. During the early phase, in the transition from high peacetime to high wartime production, industrial mobilization would be geared primarily to the pace of conversion of facilities and materials.

Under high employment conditions, however, it would be essential from the start to effect close coordination between production and manpower controls. Only with fairly comprehensive manpower controls could the supply of labor be

prevented from limiting war production even in the early phase. Provision must be made, moreover, for a smooth transition to the situation after 1 or 2 years, in which manpower supply would become the general limiting factor. This requires the careful planning of the distribution of manpower between the armed services and civilian work, both as to total numbers and as to occupational deferment policy, and the closest possible collaboration between the production and manpower control agencies. In the later phases of the war (should it be sufficiently prolonged), when manpower has become the general limiting factor on war production, it may well become essential to consolidate the administration of production and manpower controls.

The scope of the manpower problem, and the methods which will be recommended to ensure orderly mobilization of both military and nonmilitary personnel, are the subjects of a study presently engaged in by the Munitions Board with the assistance of a competent civilian consulting committee. In the absence of such a study, the assumptions as to manpower on which this Annex is based, are especially tentative.

D.5.5 Availability of World War II Plants and Facilities

Owing to the relatively brief span between the ending of World War II and any war emergency within the next 5 years, it is assumed that a large proportion of the specially constructed plants and facilities for munitions (including aircraft and shipbuilding) would be available either immediately or after a brief period of conversion. It should not be necessary to construct an entire munitions industry almost from scratch. While tooling would be of great importance, especially for newer type weapons, and there would be an enormous task of rapid conversion to war work, new plant construction should be far less significant than in the period 1941-43.

D.5.6 Availability of Experienced Personnel

A war emergency within the next 5 years would find the country equipped with large numbers of personnel experienced in formulation of military requirements, in military procurement, in war supply needs, and in wartime industrial control techniques. A systematic use of such experience should make it possible to staff an industrial control organization rapidly, in keeping with the assumed needs for immediate large-scale mobilization and correspondingly strict industrial control. Advance provision should be made in peacetime for the smooth recruitment of such personnel into the procurement services and the civilian control agencies.

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